EPA-670/2-73-047a
August 1973

Environmental Protection Technology Series

Methods For Improvement Of Trickling Filter Plant Performance - Part I - Mechanical And Biological Optima

Office of Research and Development
U.S. Environmental Protection Agency
Washington, D.C. 20460

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METHODS FOR IMPROVEMENT OF TRICKLING FILTER PLANT PERFORMANCE

PART I

MECHANICAL AND BIOLOGICAL OPTIMA

by

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Contract #14-12-505
Project #11010 DGA
Program Element #1B2043

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OFFICE OF RESEARCH AND DEVELOPMENT
U. S. ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D. C. 20460

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ABSTRACT

The Chapel Hill high rate trickling filter plant which consists of two parallel and equal lines of treatment units was operated in parallel as two separate plants over a period of 26 months. Each side was operated with various fractions of influent flow and recirculation flow rates. Statistical analysis of operating results indicated that the common mathematical models are not reliable in predicting daily performance at the Chapel Hill plant. They are, however, useful in predicting long term average performance. Recirculation ratios as high as 3.0 proved beneficial at total hydraulic loadings of less than 20 mgad. Operation above this loading is not currently feasible at Chapel Hill.

The hydraulic surface loading of the final settling tanks was found to have a significant effect on overall plant performance. A surface loading of 500 gpd/ft^2 is recommended for the design of final tanks in new plants.

Pilot plant studies using 4-foot diameter rock filters indicate a significant advantage for two-stage filtration even though the hydraulic loading on each stage may be double that for single-stage operation.

Pilot plant studies of activated sludge treatment of trickling filter effluent were conducted. The process proved effective in improving removal of BOD, if effective final solids removal facilities are provided. The process also proved effective in reducing nitrogenous oxygen demand.

This report was submitted in fulfillment of Project Number 11010 DGA, Contract Number 14-12-505 between the University of North Carolina and the U. S. Environmental Protection Agency.

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FIGURES (continued)

FIGURES (continued)

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SECTION I

CONCLUSIONS

A. TRICKLING FILTER STUDIES

To improve the performance of existing trickling filter plants with a minimum of modification the following procedures are recommended:

1. If two filters are available, and two-stage or parallel operation of the filters is possible, the two-stage method should be used as it will provide significantly better performance.

2. Filter recirculation ratios of up to 3.0 will significantly improve the performance of most high rate filters. If pumping capacity permits this level of recirculation, it should be used.

3. If filter recirculation is drawn from a point downstream of the final settling tanks the entire plant flow plus recirculation flow must pass through the tank. The final settling tank will be much more effective as a solids separation unit if recirculation is withdrawn before the final tank. Therefore, overall plant performance will be improved.

4. The quality of anaerobic digester supernatant and its method of return to the plant flow units can have a significant effect on plant performance. The intermittent, high rate, return of supernatant from a mixed digester will have a deleterious effect. The continuous return of supernatant from an unmixed secondary digester during periods of low plant flow, e.g., during the night, will have little effect on plant performance. Therefore, when two or more digesters are available, one unit should be operated as a secondary to provide conditions for the thickening of sludge and the separation of supernatant.

The performance of some trickling filter plants can be improved with minor additions or revisions, e.g.:

1. Additional recirculation pumping capacity may be provided by installing larger pump impellers with higher horsepower motors. Plant performance will be improved.

2. If two filters exist at a plant but no provision has been made for two-stage filtration, the necessary facilities, i.e., pumps, control boxes, and flow control systems, can be added to permit two-stage operation. Two-stage filtration will improve performance.

When new trickling filter plants are being designed or major additions are to be made to existing facilities, the following factors should be carefully considered:

1. Trickling filter plant performance is not significantly affected by the point of recirculation return, i.e., ahead of the primary settling tank or directly to the filter. For this reason direct recirculation is recommended, as a smaller primary tank will be required to meet design standards. The money saved in this manner should be invested in larger final settling tanks.

2. Final settling tank design should be based on a surface loading of 500 gpd/ft^2. At this loading the performance of the tank will be enhanced during both single- and two-stage operation of filters. Furthermore, the settling tank will be suitable for the separation of chemical floc if phosphorus removal or enhanced overall performance is required at some future date. In this regard, structures to facilitate the future addition of chemicals should be incorporated into initial plant construction. This would include provision for the addition of rapid mixing, flocculation, and space for chemical storage and feeding equipment.

3. At least two trickling filters should be provided along with facilities and controls to permit two-stage operation and interchange of the lead and secondary filters. When the proposed facility is so small that two filters are not economical, another treatment method should be considered.

4. Existing mathematical models and models developed during this investigation are not reliable predictors of the daily performance of the Chapel Hill high rate trickling filter plant. The models developed during this study are, however, suitable for the prediction of average performance over a period of several weeks.

B. ACTIVATED SLUDGE PILOT PLANTS

1. An activated sludge process is readily maintained with trickling filter effluent as feed. The process significantly, but not spectacularly, improves overall removals of BOD , total organic carbon, and suspended solids. Short (< 1 hr) aeration periods suffice to increase overall BOD removals by 3-5%. BOD removals generally increase with detention time.

2. Consistent performance of the tertiary activated sludge process depends to a large extent on effective solids removal. With effective solids removal substantial BOD removals can be achieved even at 0.4 hr detention. With effective removal of suspended solids, overall BOD removals greater than 90% can be achieved.

3. Extensive nitrification can be achieved in the tertiary activated sludge process. Significant reductions of organic and ammonia nitrogen concentrations indicate that substantial reduction of the nitrogenous oxygen demand (NOD) can be accomplished. The amount of NOD reduction is largely a function of aeration time and BOD loading. In the relatively soft Chapel Hill water addition of bicarbonate alkalinity enhanced nitrification.

   NOD removals of greater than 80% were achieved under conditions of low influent BOD concentration (35 mg/ℓ), bicarbonate addition, and 1-9 hr detention time. With an average influent BOD of 72, more than 4 hr were required.

   With low influent BOD levels, even at short aeration times (< 1 hr) NOD reductions of greater than 50% were observed.

   Extensive nitrification (> 90%, based on removal of influent ammonia) frequently occurred when the pH in the aerator averaged less than 7.0, leading to the conclusion that the optimum pH range for nitrification is not as narrow as indicated by previous investigators.

   Based on these studies, if NOD reduction is required in upgrading an existing trickling filter plant, terminal activated sludge treatment may provide an acceptable solution. If NOD reduction is required in a new plant, trickling filter treatment followed by activated sludge treatment may allow the activated sludge system to operate more successfully due to the dampening effect of the filter on changes in influent quality.

SECTION II

RECOMMENDATIONS

A. TRICKLING FILTERS

1. New trickling filter treatment facilities should be designed for two-stage operation with provision for interchange of the lead filter.

2. The effectiveness of intermediate settling between filter stages should be determined.

3. Studies of deep filters designed to operate at high hydraulic loadings, with continuous rather than intermittent liquid application, would help in the verification or modification of rational filter performance models as developed by Howland, Schulze, and Eckenfelder. With the proper experimental operation of such filters the effect of both liquid detention and liquid turbulence might be determined. The systematic development of deep filters or multi-stage filtration processes designed to operate at high hydraulic loadings could result in significant economies while the traditional advantages of the trickling filter process, i.e., simplicity of operation and resistance to upset, could be retained.

4. Final settling tanks in new trickling filter plants should be designed at an average surface loading of 500 gallons/day/ft^2. Designers should provide for the future addition of chemical treatment, i.e., provision should be made for the installation of mixing and flocculation equipment prior to final settling.

B. ACTIVATED SLUDGE PILOT PLANTS

1. The effect of pH, alkalinity, and organic loading on nitrification systems should be examined further. Whereas such factors have been extensively investigated in laboratory studies with defined media, further information is needed on their effect on actual treatment systems. In addition, development of a good method for determining the relative numbers of nitrifiers in a given sample of sludge would be useful in formulating a valid description of the relationship of mixed liquor suspended solids concentration to nitrifying activity.

2. The effectiveness of the trickling filter - tertiary activated sludge process should be verified at full-scale. In particular, the following parameters need assessment: temperature variations, sludge production, control of effluent solids.

SECTION III

INTRODUCTION

A great many secondary municipal wastewater treatment plants in the United States use trickling filters as the biological units. Most of these are "high-rate" installations, characterized by relatively heavy rates of wastewater application with recirculation of treated effluent to dilute influent before application to the filter. Typically, trickling filter plants attain 70-85% BOD removal through the entire facility, including removal of about one-third of the influent BOD by primary sedimentation.

Modern technology of wastewater treatment and pressures for higher removals of BOD, suspended solids, and other constituents have resulted in trends toward installation of activated sludge instead of trickling filters in new plants. Nevertheless, thousands of communities in the U.S.A. still have trickling filter installations. Most perform at a level which is, or soon will be, inadequate for meeting regulatory requirements, leaving those municipalities in the situation of having to enhance plant efficiency. That could be accomplished through merely enlarging existing facilities, adding other types of treatment processes, or replacing their trickling filters with other types of units.

Information currently available to design engineers and operating personnel is inadequate to permit accurate selection of optimum systems for enhancing performance of trickling filter plants to levels that might be required. The overall objective of this project was to develop information which could help design engineers and operating personnel select among practical alternatives available for improving performance of trickling filter plants.

The general approach was based on experimental investigations at laboratory, pilot- and full-scale. They were conducted at the Mason Farm Sewage Treatment Plant in Chapel Hill, North Carolina, operated for the Town by personnel in the Department of Environmental Sciences and Engineering at the University of North Carolina. The most recent plant enlargement (1968) included modifications to provide unusual flexibility in full-scale operation, as well as facilities for laboratory and pilot studies. Among other unusual features, the new units were designed to permit operating the plant as two separate identical trickling filter installations, between which the influent flow could be divided in any desired proportion with capability for independent control of recirculation and other aspects of operation in each.

The experimental program was designed to develop practical information which would be valuable to engineers engaged in modifying trickling filter plants to improve performance and to evaluate techniques which could be applied by plant operators to assure optimum performance of existing and proposed units. Activities were directed principally towards evaluating the effects of various parameters on treatment efficiency and investigating the performance of an activated sludge system based on installation of an aeration tank between the trickling filter and final settling tank. Each investigation involved use of several experimental facilities to study various aspects of operation, as will be discussed in detail in appropriate sections of the report.

SECTION IV

CHAPEL HILL PLANT AND WASTEWATER RESEARCH CENTER

A. Plant Design

The Wastewater Treatment Plant for Chapel Hill is a conventional high-rate trickling filter installation treating predominantly domestic sewage. There is substantially no industrial or other unusual contribution, except for hospital and laboratories of the University of North Carolina. Table 4-1 summarizes some of the more pertinent characteristics of the influent for the period of this study, 9/69-1/72. Figure 4-1 is a partial flow sheet for the Plant and Table 4-2 summarizes characteristics and design parameters of major units.

Incoming wastewater passes through a mechanically cleaned bar screen, with a manual unit serving as a backup in case of failure. Subsequently, the flow is metered and grit removed in a detritor. Design of the grit removal effluent structure allows splitting of flow into any desired proportions for diversion to the two identical treatment plant batteries.

Based on total plant influent of 3.0 mgd, equally divided between the two batteries, and recycle ratio of 2:1 the 70-foot primary clarifiers provide 1.8 hours detention and overflow rate of 1180 gals/ft^2/day. Each trickling filter is 120-feet in diameter with a stone depth of 4.25 feet, providing a "design" loading of about 35 lbs. BOD/day/1000 cf (assuming one-third removal in the primary) at hydraulic loading approximating 17 mgd/acre. Trickling filter effluent passes through a wet well from which any or all of three pumps take recycle at rates up to 7.5 mgd in each battery. Net plant flow (no recycle) passes to 45-foot final clarifiers, providing 1.9 hours detention at 1.5 mgd and 960 gals/ft^2/day at 1.5 mgd through each battery.

B. Plant Operation

Normal plant operation is based on recycle to the primary clarifier influent, but a connection has been provided to permit recycling directly around each trickling filter, without settling. Series or stage operation of the filters is not possible. Typically, the plant operates with the batteries in parallel, as shown in Figure 4-1, in effect providing two separate treatment facilities. The influent sewage can be divided between these as desired for operation at different loadings and recycle in each adjusted independently.

Sludge from each final settling tank is pumped to influent of the primary clarifier, in which it settles again in combination with primary sludge. Sludge and scum are pumped from primary clarifiers to a 75-

TABLE 4-1

CHARACTERISTICS OF PLANT INFLUENT*
September, 1969 - February, 1972
(Monthly Averages)

	BOD_5 mg/ℓ	SS mg/ℓ	TOC mg/ℓ	Kjeld -N mg/ℓ	NH_3 -N mg/ℓ	NO_3 -N mg/ℓ	TP mg/ℓ	TIP mg/ℓ	MBAS mg/ℓ	pH	Alk. mg/ℓ as $CaCO_3$
9/69	167	238	140	42.3	29.1	0.10	14.0	10.1	3.85		
10/69	176	262	125	38.1	27.0	0.08	8.8	7.4	3.57		
11/69	153	186	113	43.4	28.4	0.05	----	----	3.34		
12/69	170	159	107	43.8	27.3	0.05	----	----	3.43		
1/70	193	170	139	29.8	19.5	0.30	----	9.3	2.91		
2/70	182	185	124	36.6	20.0	0.30	----	8.3	2.39		
3/70	159	162	116	37.7	21.9	0.28	----	8.5	2.75		
4/70	165	150	109	37.2	23.7	0.30	----	8.2	2.76		
5/70	142	189	100	33.5	23.0	0.26	10.8	7.9	2.67		
6/70	117	169	117	33.6	21.7	0.19	11.5	8.8	3.04		
7/70	126	146	116	36.6	22.2	0.23	10.6	8.6	3.06		
8/70	176	187	112	32.2	22.2	0.16	10.3	7.9	2.57		
9/70	141	159	114	26.3	22.3	0.12	11.2	9.2	2.60		
10/70	136	198	110	37.1	26.3	0.14	11.1	8.5	3.10		
11/70	143	195	116	35.5	22.8	0.20	10.9	6.5			
12/70	150	175	130	35.8	23.2	0.14	11.6	7.5		7.3	
1/71	128	156	111	28.8	22.0	0.18	11.5	6.4		7.4	141
2/71	134	156	120	28.2	20.6	0.10	8.8	6.0		7.0	133
3/71	134	163	111	28.8	20.2	0.10	8.6	5.8		7.1	131
4/71	136	189	123	31.2	26.5	0.10	9.0	6.8		7.2	152
5/71	159	172	148	30.0	25.5	0.20	9.7	5.8		7.2	150
6/71	156	195	132								
7/71	136	168	121	30.2	20.5	0.17	10.8	8.1			
8/71	134	146	130	25.6	19.2	0.20	9.7	7.0			
9/71	188	136	142	28.1	24.7	0.50	9.4	6.7			
10/71	140	120	114								
11/71	170	167	154								
12/71	183	187	148								
1/72	170	186	146	30.6	20.3	0.26	10.9	7.4		7.0	
2/72	161	162	138	28.5	21.7	0.13	9.1	7.0		7.0	
Ave	154	174	124	31.2	23.1	0.19	10.4	7.7	3.00	7.2	141
Max	193	262	154	43.8	29.1	0.50	14.0	10.1	3.85	7.4	152
Min	126	120	100	25.6	19.2	0.05	8.8	5.8	2.39	7.0	131
Cases	30	30	30	26	26	26	20	24	14	8	5

***Based on analytical methods described in Table 4-3**

TABLE 4-2

CHARACTERISTICS AND DESIGN PARAMETERS OF UNITS
IN CHAPEL HILL TREATMENT PLANT

CURRENT AVERAGE FLOW   Approximately 3.0 mgd

SCREENS:
- a) One automatic, mechanically-cleaned
- b) One manually-cleaned (Standby)

GRIT REMOVAL
One mechanically-cleaned detritor

PRIMARY SETTLING (Two units)
- a) Diameter = 70 feet
- b) Water depth = 12 feet
- c) Detention = 1.8 hours (2:1 Recycle)
- d) Overflow rate = 1180 gals/ft^2/day (@ 2:1 Recycle)
- e) Mechanical sludge and scum removal

TRICKLING FILTERS (Two units)
- a) Diameter = 120 feet
- b) Stone depth = 4.25 feet
- c) Rotary distributors
- d) BOD_5 loading about 35 lbs/day/1000 c.f. (Assuming 1/3 removal in primary)
- e) Hydraulic loading = 17 mgd/acre (2:1 Recycle)

FINAL SETTLING (Two units)
- a) Diameter = 45 feet
- b) Water depth = 10 feet
- c) Detention = 1.9 hours
- d) Overflow rate = 960 gals/ft^2/day
- e) Mechanical sludge removal

RECIRCULATION PUMPS
In each battery, one 1.5 mgd and two 3.0 mgd units.

DIGESTERS
- a) One 75' diameter, mechanically mixed, heated, floating cover
- b) One 50' diameter, mechanically mixed, heated, floating cover
- c) One 50' diameter, no mixing, floating cover (not now in operation)
- d) Heat exchanger (Digester gas or propane) for units in operation now, including pumps, control valves, interconnecting piping

SLUDGE DEWATERING

a) 18 drying beds, 25' x 50', uncovered
b) One 18" bowl, 15-17 gpm, Bird centrifuge

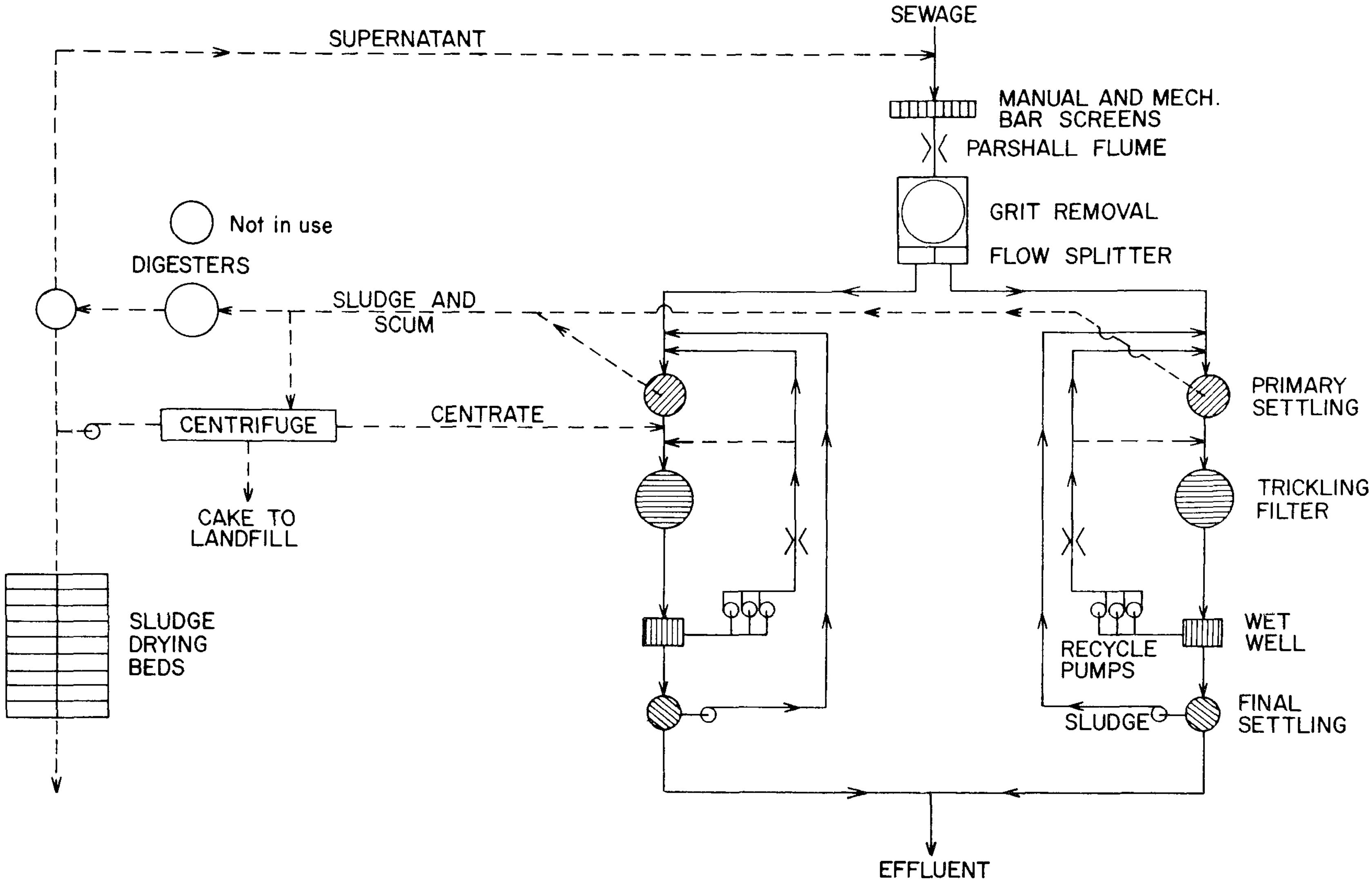


FIGURE 4-1 - PARTIAL FLOW SHEET FOR CHAPEL HILL PLANT foot diameter digester equipped with floating cover and mixer. A 50-foot diameter digester, with infrequently used mechanical mixer, serves as a second stage digester. Supernatant from the secondary digester is decanted during periods of low plant flow at a low rate of flow to the plant influent. Gas produced in the process is utilized for heating the sludge digesters and the excess burned in a flare.

Digested sludge usually is dewatered on 18 uncovered sand drying beds. When required by weather unfavorable for sludge drying, a centrifuge is available for dewatering. This unit also may be used for dewatering undigested sludge if unusual circumstances require reduction of loading on the sludge digesters.

C. Sampling Procedures

Since the plant is only staffed by Chapel Hill for 8 hours each weekday and not at all on weekends, it was necessary to construct an automatic sampling system. Sampling points include influent, effluent from each primary tank, effluent from each trickling filter, and effluent from each final tank. The samples flow by gravity or are pumped continuously to overflowing standpipes in the operations building. A timer-controlled Blue pump[1] pumps sample water to a solenoid flop valve[2]. The valve is in a "waste" position for a sufficient time to purge all of the sample lines (approximately 60 sec.). The valve is then switched to the "sample" position for 2 sec during which time the sample flows into sample containers stored in a 2-4°C refrigerator. Samples are collected and composited at 30 minute intervals twenty-four hours per day, five days per week.

Figure 4-2 is a photograph of the sampling system showing standpipes, Blue pump, timer, solenoid valves, and sample refrigerator. The additional solenoid valves are used for an automatic sampling system of the same design for the trickling filter pilot plants.

D. Wastewater Research Center

1. Facilities

The Town of Chapel Hill and the UNC Department of Environmental Sciences and Engineering have an agreement under which Departmental faculty have assumed responsibility for supervising operation of the treatment plant. Also, as part of that agreement, the Town has made available to the Department laboratory space at the plant for experimentation relating to plant operation and other research activities. The complex of full scale, laboratory and pilot facilities at the plant is staffed by

[1]John Blue Manufacturing Company, Laurinburg, North Carolina
[2]Sears, Roebuck and Company, Sud Saver Valve No. 99830

Departmental professional and support personnel, comprising the "UNC Wastewater Research Center."

Analytical and research laboratories at the Center occupy six rooms with total area of 1300 square feet. Two rooms are equipped for close temperature control. One is used principally for BOD analyses and the other for fish bioassay studies or biological treatability studies.

The routine analytical laboratories are equipped for a wide variety of physical, chemical and biological work, including TOC, BOD, COD, various types of solids, turbidity, pH, volatile acids, and microbiological studies. An extensive array of Technicon Autoanalyzer equipment is available in Departmental laboratories on campus with units for determining all forms of nitrogen, phosphorus and MBAS. Also, an atomic absorption spectrometer is available in the Departmental laboratories, as well as many other types of specialized equipment which are available as may be desired.

About 500 square feet of additional space is available in the main building at the plant for bench-scale and small pilot equipment. Units available in this location include five 0.1 gpm activated sludge units which were used extensively during early phases of these studies. Adjacent to that building is an installation of four 4.0-foot diameter pilot trickling filters in a separate enclosure of about 400 square feet. An outside view of these units is shown in Figure 4-3.

A new prefabricated metal building at the Center encloses 1800 square feet of offices and space suitable for constructing and operating larger pilot plants. This building is shown in Figure 4-4.

2. Analytical Procedures

The procedures for the chemical analyses associated with this study were standard procedures and are listed in Table 4-3.

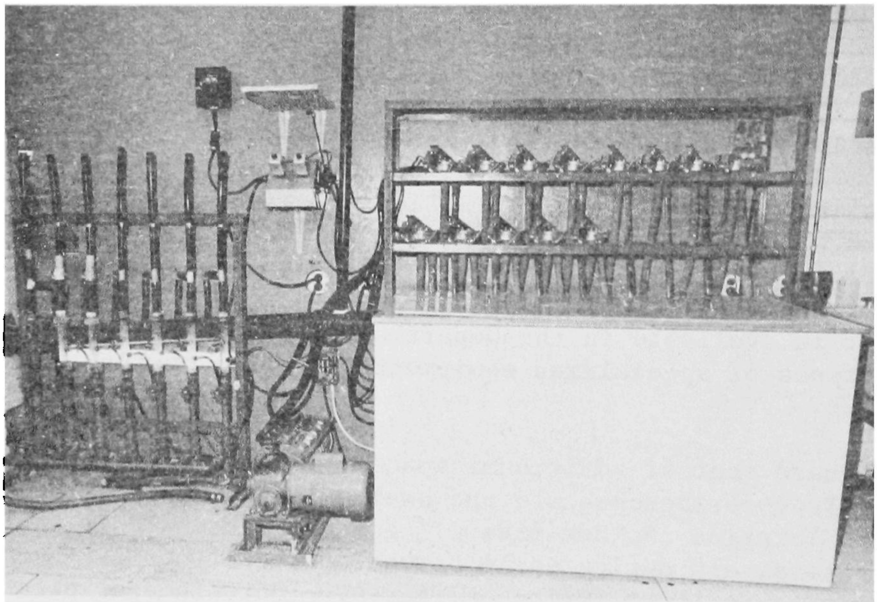


FIGURE 4-2 AUTOMATIC SAMPLING SYSTEM

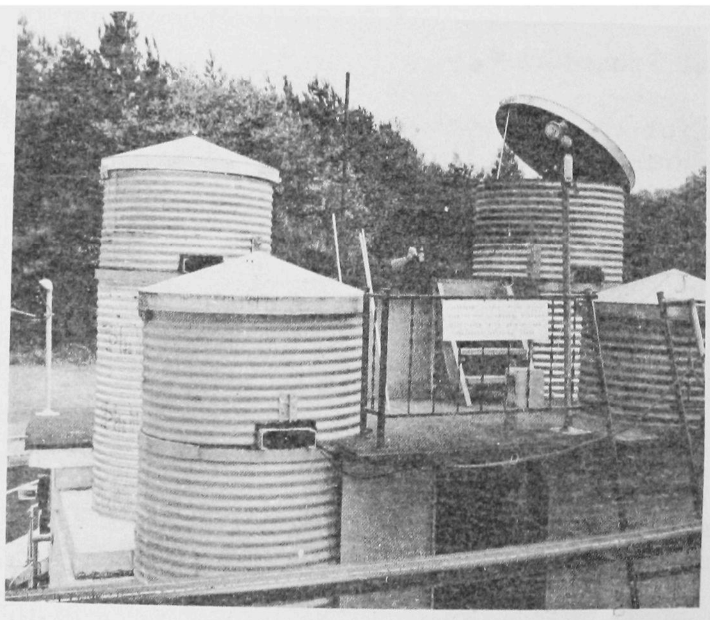


FIGURE 4-3 TRICKLING FILTER PILOT PLANTS

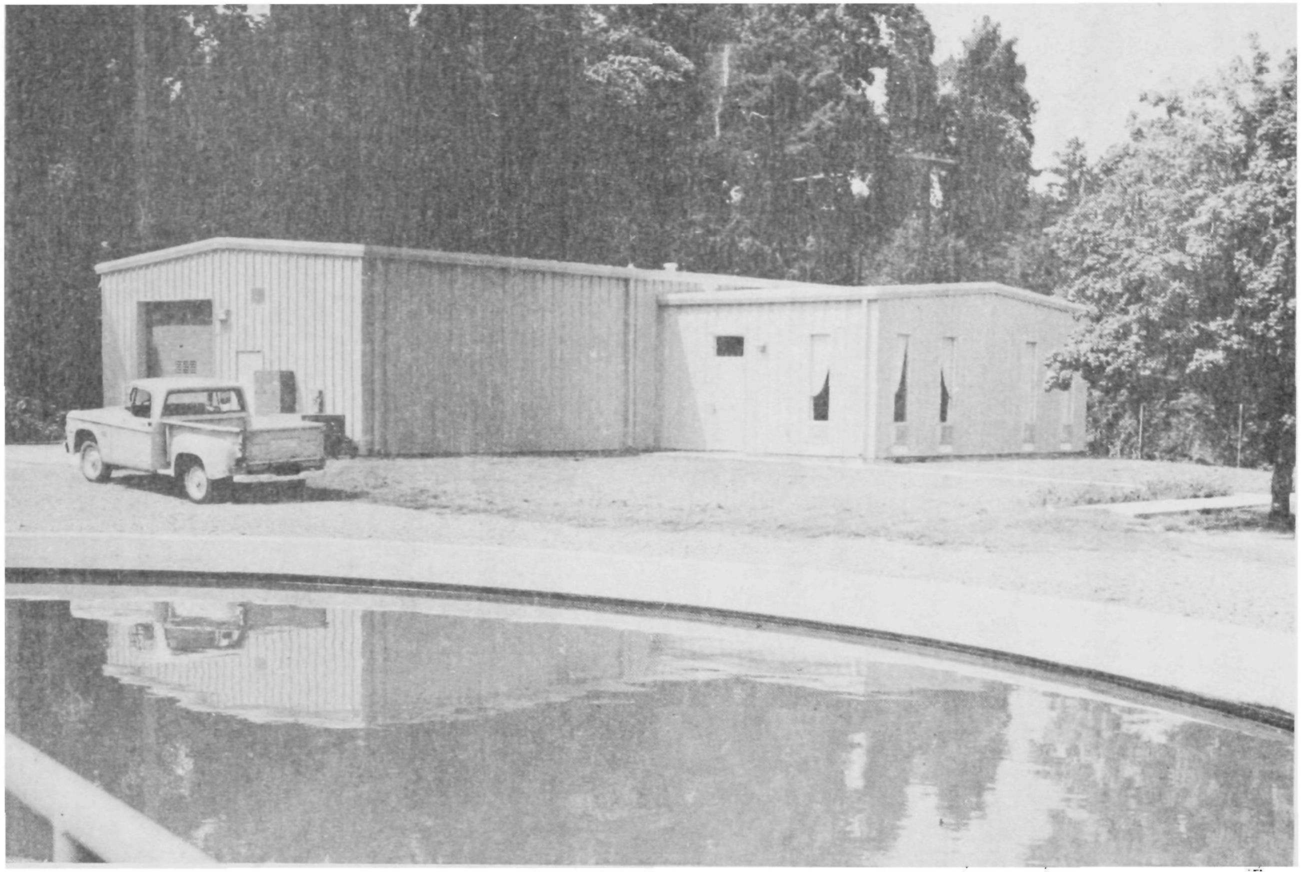


FIGURE 4-4 PILOT PLANT BUILDING, UNC WASTEWATER RESEARCH CENTER

TABLE 4-3

ANALYTICAL PROCEDURES

PARAMETER	METHOD	REFERENCE
Alkalinity, Total (as $CaCO_3$)	Electrometric Titration - pH 4.5	1
Biochemical Oxygen Demand (BOD, 5 day, 20 C)	YSI DO Analyzer (probe method) (modified blank depletion)	2
Carbon - Inorganic Organic (TOC)	Dow-Beckman Carbonaceous Analyzer Model No. 915 (Dual Channel)	1
Chemical Oxygen Demand (COD)	Dichromate reflux - 0.25 N	2
Chloride (Cl^-)	Mercuric Nitrate Titration	2
Dissolved Oxygen (DO)	Winkler-Azide or YSI DO Analyzer (probe method)	2
Methylene Blue Active Substances (MBAS)	Methylene Blue	2
Metals, Total Dissolved	Perkin-Elmer Model 303 Atomic Absorption Unit Filtration through 0.45 μ membrane filter	1
Nitrogen, Ammonia (NH_4^+-N)	Technicon AutoAnalyzer - Sodium Phenolate	1
Nitrogen, Kjeldahl, Total (Kjeld-N)	Technicon AutoAnalyzer - Digestion + Phenolate	1
Nitrogen, Nitrate (NO_3^--N)	Technicon AutoAnalyzer - Hydrazine Reduction	1
Nitrogen, Nitrite (NO_2^--N)	Technicon AutoAnalyzer - Diazotization	1
pH	Electrometric	2
Total Phosphorus (TP)	Persulfate Digestion + Technicon AutoAnalyzer Automated Stannous Chloride	1
Total Inorganic Phosphorus (TIP)	Automated (single reagent) Hydrazine Sulfate Reduction Modification*	1

TABLE 4-3 (continued)

PARAMETER	METHOD	REFERENCE
Solids, Total (TS)	Gravimetric, 103°C (Method 224 A)	2
Solids, Total Volatile (TVS)	Gravimetric, 550°C (Method 224 B)	2
Solids, Suspended (SS)	Gooch Crucible Filtration, 103°C (Method 224 C)	2
Solids, Volatile Suspended (VSS)	Gooch Crucible Filtration, 103°C Gravimetric, 550°C (Method 224 D)	2
Solids, Settleable	Volume (Method 224 F)	2
Solids, Suspended (after settling)	Method 224 C, on supernatant prepared by Method 224 F	2
Solids, Volatile Suspended (after settling)	Method 224 D, on supernatant prepared by Method 224 F	2
Solids, Mixed Liquor Suspended (MLSS)	Known volume of sample is centrifuged and solids removed are dried and weighed	UNC Wastewater Research Center method
Turbidity (JTU)	Hach Model 2100 Turbidimeter	Hach manual
Volatile Acids	Distillation Method (tentative)	3

[1]FWPCA. 1969. *FWPCA Methods for Chemical Analysis of Water and Wastes*. U.S. Department of Interior, Federal Water Pollution Control Administration. Analytical Quality Control Laboratory, Cincinnati, Ohio.
[2]APHA, AWWA, WPCF. 1965. *Standard Methods for the Examination of Water and Wastewater*, 12th edition. American Public Health Association, Inc., New York, New York.
[3]*Ibid.*, 11th edition, 1960.

*Total Inorganic Phosphorus (Automated Method):
The unfiltered sample is treated by mild acid hydrolysis (2.5 N H_2SO_4 at 90 °C), followed by orthophosphate determination. Ammonium molybdate reacts with phosphorus in an acid medium to form a phospho-molybdate complex. This complex is reduced to an intensely blue-colored complex by hydrazine sulfate. The color is proportional to the phosphorus concentration. The result includes dissolved and suspended orthophosphates and acid-hydrolyzable phosphates originally present in the sample.

SECTION V

TRICKLING FILTER STUDIES

A. OBJECTIVES

For years, prior to the advent of package aeration plants, the trickling filter process predominated in small and medium sized wastewater treatment plants. Filters have the advantage of being able to quickly recover from shock loads and will provide good performance with a lower level of skilled technical supervision (4). The initial costs of trickling filter plants are comparable with those for activated sludge; however, operating costs are lower as power costs are substantially less (5).

A number of mathematical models have been suggested for predicting the performance of trickling filters [Velz (6), NRC (7), Rankin (8), Howland *et al.* (9, 10, 11, 12), Schulze (13, 14, 15), Stack (16), Eckenfelder (17), Galler and Gotaas (18), Lamb (19)] but there are significant differences in factors included in the models and in the performance predicted under similar conditions. Accordingly, one of the principal objectives of the experimental work described in this chapter was to determine if a reliable predictive model could be developed for the Chapel Hill plant and to examine the effect of several variables on filter-final tank performance.

Other objectives were 1) to study the effect of the pattern of recirculation on plant performance, 2) to investigate the probable effect of converting the Chapel Hill plant from single- to two-stage filtration and 3) to examine the effect of final settling tank loadings on plant performance. Because it was impossible to operate the Chapel Hill plant in two-stage filtration, this phase of the work was conducted with the use of a pilot plant. Data for other phases of the study were drawn from the operation of the full scale plant.

B. EXPERIMENTAL PROGRAM

During the period from November 18, 1969 through January 24, 1972, the two sides of the full scale Chapel Hill plant were operated experimentally to investigate the effect of a number of variables on plant performance. The three factors which could be varied were

1) the fraction of influent flow which could be directed to each side of the plant

2) the recirculation flow on each side of the plant

3) the pattern of recirculation.

During the experimental program the fraction of influent flow to each side of the plant was manipulated with the use of the division plate downstream from the grit removal chamber. Flow divisions ranged from a 0-100 percent split to a 50-50 percent split. The various divisions used during the experimental program were 50-50, 33-67, 20-80 and 0-100. The 0-100 percent division experiment was conducted during a period when one of the filters was out of service for an extended period to replace filter distributor arms.

Recirculation flow was varied with the use of various combinations of the three recirculation pumps available on each side of the plant. Minor variations were obtained by throttling individual pump discharges. During the experimental program recirculation flow varied from 0.65 mgd to 4.20 mgd.

The ability to vary influent flow division to each side of the plant and the recirculation flows allowed variation in other factors which are normally included in mathematical models for predicting trickling filter performance, i.e., hydraulic loading, organic loading and recirculation ratio. During the series of experiments the hydraulic loading on the filters ranged from a low of 5.4 mgad to a high of 22.5 mgad; organic loading, from 265 to 35 lbs BOD/day/acre-feet (6.1-80.5 lbs/day/1000 ft^3); and the recirculation ratio [(recirculation flow)/(influent flow to a side)], from 0.27 to 6.94. Wastewater temperature was recorded daily and ranged from a low of 11.0 °C to a high of 28.0 °C.

During the experimental work sufficient data were obtained with equal influent flow division and equal recirculation flows on each side to determine whether the two sides of the plant would produce equal results under equal loading conditions.

The pattern of recirculation flow was also varied during one period. The normal pattern of recirculation at the Chapel Hill plant is to return filter effluent to the head end of the primary settling tank. An alternate method permits recirculation directly around the filters.

C. SAMPLING, ANALYSES AND DATA HANDLING

During the experimental program with the full scale trickling filters daily composite samples of wastewater were obtained from the following points in the plant:

<u>Influent</u>, following screening and grit removal

<u>Primary Settling Tank Effluent</u>, from each of the two primary settling tanks

<u>Trickling Filter Effluent</u>, from each of the two filters

<u>Final (Secondary) Settling Tank Effluent</u>, from each of the two final settling tanks.

Samples were collected with a heavy duty multitube type pump. During the sampling cycle all sample pump discharge lines were flushed before the sample was diverted to the accumulation containers. Sample containers were stored in a cold chest held at approximately 4° C. All analytical and operating data collected during the main plant experimental program are shown in Appendix A. Analytical procedures are described in Section IV.

Several months after the initiation of data collection it was realized that accurate analysis of the data being accumulated would require the use of a computer. It was decided to store all of the main plant data on a computer generated file from which specific data could be selected for report printing or statistical analysis. In addition, it was felt that the data collected during this study would be of use to other investigators and should be in a form that could be readily transferred.

Rather than develop our own file-handling system, we utilized the file capabilities of a system known as the Statistical Package for the Social Sciences (SPSS, National Opinion Research Center, University of Chicago). This system allows calculations from raw data and storage of new variables such as hydraulic loading. In addition, the statistical section of SPSS allows ready statistical analysis of any or all data in the master file. If SPSS is unsuitable for a particular report format or statistical analysis, it allows the creation of an output file which may then serve as an input file to any other statistical or report-generating program.

The entire master file for the period November 19, 1969 to January 24, 1972 is permanently stored at the Computation Center of the University of North Carolina on a magnetic tape, UT3500. Requests for copies of this tape and the tape format may be addressed to the authors. The data in this file is reproduced in Appendix A of this report.

D. EQUALITY OF THE TWO SIDES OF THE PLANT

One of the principal objectives of the experimental work with the main plant was to determine the effect of the several variables, i.e., organic loading, hydraulic loading, recirculation ratio and temperature, on plant performance. The logical first step was to determine if the two sides of the plant would produce comparable results under conditions of equal loading and temperature on each side. Accordingly, during three separate periods within the experimental program, the operating variables were constant. The mean overall plant performance in terms of percent removal of BOD_5, SS and TOC is shown below:

TABLE 5-1

MEAN OVERALL PERCENT REMOVAL OF BOD_5, SS AND TOC DURING PERIODS OF EQUAL LOADING ON THE TWO SIDES OF THE PLANT

	11/18 - 12/15/69			3/1 - 4/7/71			11/25 - 12/21/71		
	BOD_5	SS	TOC	BOD_5	SS	TOC	BOD_5	SS	TOC
Side 1	75.2	79.6	62.2	54.7	59.9	45.0	73.6	80.2	71.1
Side 2	75.5	78.1	61.6	58.7	58.1	48.3	73.6	75.5	67.9

Statistical analysis of the individual items of data which resulted in the mean removals shown in Table 5-1 indicated that the two sides of the plant could be considered equal in regard to performance when operated under the same loading conditions. This is an important conclusion as it allowed the data collected on Side 1 to be analyzed with the data collected on Side 2 as if all observations had been made on one side only.

E. PATTERN OF RECIRCULATION

The effect of recirculation pattern on plant performance was studied by recirculating filter effluent through the primary settling tank on one side of the plant, while recirculating directly around the filter on the other side, as shown in Figure 5-1.

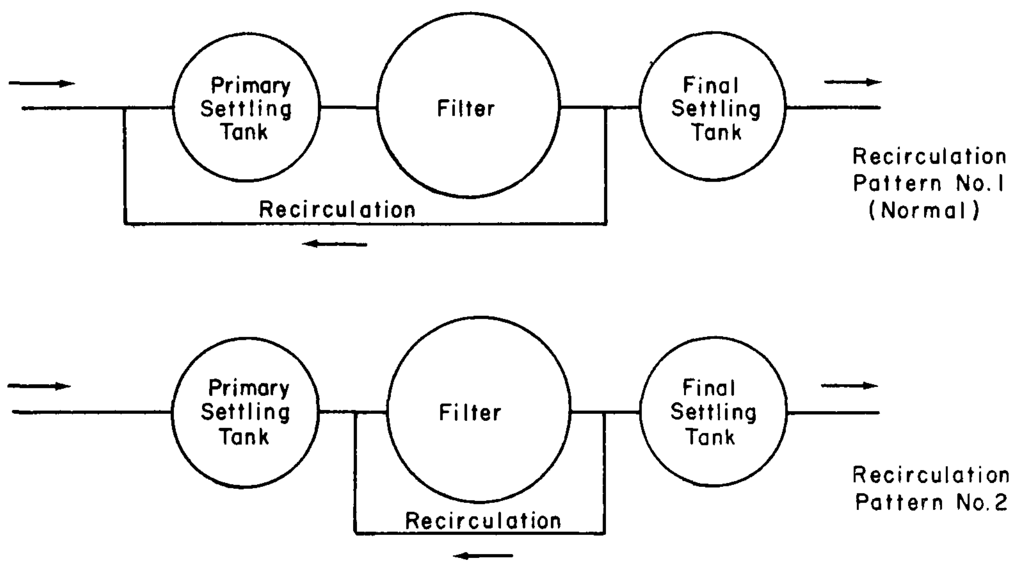


FIGURE 5-1
POSSIBLE PATTERNS OF RECIRCULATION AT THE CHAPEL HILL PLANT

This method of operation was maintained during the period from 7/16 through 8/24/72. The pattern of recirculation on the two sides was reversed during the period 9/8 through 9/21/71. Influent flow was split 50-50 and the recirculation ratio was maintained the same on both sides during each test period. During both experiments, the side in which recirculation was through the primary tank yielded slightly better performance. Average results in terms of overall removal of BOD and SS on the two sides are shown in Table 5-2.

TABLE 5-2

OVERALL PERCENT REMOVAL OF BOD AND SS WITH TWO PATTERNS OF RECIRCULATION

	7/16 - 8/24/72		9/8 - 9/21/72	
	Pattern No. 1 Side No. 1	Pattern No. 2 Side No. 2	Pattern No. 2 Side No. 1	Pattern No. 1 Side No. 2
BOD	81.7	79.2	83.1	85.1
SS	76.6	78.0	88.1	89.1

One important effect of recirculation through the primary tanks in the Chapel Hill plant is the reduction of odors. Filter effluent normally has a dissolved oxygen concentration of 4 to 6 mg/l. The mixing of recirculated flow with raw sewage tends to keep the mixture reasonably fresh as it passes through the primary settling tanks. Primary settling tank detention time at the Chapel Hill plant, at an influent flow of 3.0 mgd and a recirculation ratio of 2.0, is 1.9 hours. When recirculation is directly around the filter the detention time in the primary tanks increases to 5.4 hours and serious odor problems result.

F. MATHEMATICAL MODELS FOR TRICKLING FILTER PLANT PERFORMANCE

As mentioned previously various mathematical models have been suggested by different investigators. Although engineers have used these models as a convenient design tool, none have been generally accepted as a truly reliable predictive device. Any model which is generally valid would be an aid to optimum filter design or to more efficient operation of existing plants in cases where the designer has provided some degree of operating flexibility.

Mathematical models for trickling filter performance can be divided into two general types, i.e., regression models and rational or semi-rational models. Existing models are all based on predicting removal of BOD. Accordingly, the BOD data collected in the Chapel Hill plant were analyzed in comparison with several widely known models. In addition a new regression equation was developed specific to the observed BOD removal at Chapel Hill.

It should be noted that all trickling filter models discussed here are designed to predict removal of BOD through filters and final settling tanks, where the final settling tank is considered to be an integral part of the filter system. Little attention has been given to the effect of final settling tank detention time or surface loading on combined performance of the system.

1. Regression Models

Galler and Gotaas (18) developed a regression equation to fit 322 observations from various trickling filter treatment plants. Data included observations relative to filter depth, hydraulic loading, organic loading, recirculation ratio, and wastewater temperature. The equation which they reported was

$$Le_a = 0.31\ Lo_a^{1.19}\ (1+D)^{-0.67}\ T^{-0.15}\ (Q/I)^{-0.72}\ Q^{-0.06} \qquad (5\text{-}1)$$

in which Le_a = final settling tank effluent BOD in lbs/acre/day

Lo_a = BOD applied to filter in lbs/acre/day (primary settling tank effluent including recirculation if any)

Q = filter hydraulic loading (mgad) (influent flow and recirculation flow)

I = influent flow (mgad)

D = filter depth in feet

T = wastewater temperature, °C

Note: Q/I = 1 + Rr in which Rr is the recirculation ratio, i.e., (recirculation flow)/(influent flow).

Galler and Gotaas reported a multiple correlation coefficient of 0.974 for Equation 5-1.

To test the validity of Equation 5-1 a total of 329 complete daily cases in which there were no missing observations were selected from the total data file. These data included results from both sides of the Chapel Hill plant. A linear regression analysis was conducted with the aid of a computer. The linear form of the equation was

$$\ell n\ Le_a = B_o + B_1\ \ell n\ Lo_a + B_2\ \ell n\ (Q/I) + B_3\ \ell n\ T + B_4\ \ell n\ Q$$

A term in filter depth was not included as depth was not a variable during the Chapel Hill plant experiments. The resulting regression equation in exponential form is

$$Le_a = 20.16\ Lo_a^{0.67}\ Q^{0.72}\ (Q/I)^{-1.37}\ T^{-0.69} \qquad (5\text{-}2)$$

The multiple correlation coefficient for Equation 5-2 is 0.84.

In Equation 5-1 the exponent 1.19 on Lo_a indicates decreasing overall BOD efficiency with increasing BOD loading; in Equation 5-2 the exponent 0.67 indicates the opposite relationship. Galler and Gotaas concluded that ".... the hydraulic (loading) rate did not contribute any significant effects to BOD removal efficiency." This conclusion was based on the low value (close to zero) of the exponent on Q in Equation 5-1. On the other hand, the term $Q^{0.72}$ makes a statistically highly significant contribution in Equation 5-2, based on the Chapel Hill plant performance. The exponent on temperature derived from Chapel Hill data implies that temperature is a more important factor in plant performance than indicated by Equation 5-1. Lastly, Equation 5-2 indicates that increased levels of recirculation are more significant in improving plant performance than suggested in Equation 5-1.

Another regression analysis was conducted in which terms Lo and Le were expressed in more conventional filter organic loading units, i.e., lbs of BOD/day/acre-foot of filter volume. In addition, the value of Lo was based on settled raw sewage BOD (SRS-BOD) and not on the mixture of settled raw and recirculated flow. The value of SRS-BOD was calculated on the basis of the primary settling removal curve presented in Fair, Geyer and Okun (20) as simulated by the following computer developed relation:

$$\text{SRS-BOD} = \text{INF-BOD}\ (1 - \text{Primary Tank Removal})$$

and Primary Tank Removal $= 3.77\ (\bar{t}p/10) - 18.1\ (\bar{t}p/10)^2 + 54.7\ (\bar{t}p/10)^3$

$$- 99.2\ (\bar{t}p/10)^4 + 103\ (\bar{t}p/10)^5 - 55.8\ (\bar{t}p/10)^6,$$

in which $\bar{t}p$ = detention time in primary tank in hours.

The values of Le and Lo used in the regression equation presented below (5-3) and in the rational and semi-rational models described later were calculated as follows:

$$Le = 8.34\ (\text{Final Effluent } BOD_5)(\text{Influent Flow})/(\text{Filter Volume}).$$

$$Lo = 8.34\ (\text{SRS-BOD})(\text{Influent Flow})/(\text{Filter Volume}).$$

The resulting regression equation, in exponential form is,

$$Le = 9.84\ Lo^{0.86}\ T^{-0.95}\ (1+Rr)^{-0.84}\ Q^{0.56}. \qquad (5\text{-}3)$$

The multiple correlation coefficient for Equation 5-3 is 0.82. The exponents on the terms in Equation 5-3 are different from those of Equation

5-2 due to the difference in the way Lo_a and Lo were computed in each case.

2. Rational and Semi-Rational Models

a. Rational Models

One of the first rational models for predicting trickling filter performance was that developed by Velz (6). After observing the removal of BOD at various depths in filters, Velz postulated that the BOD removal in each increment of filter depth was proportional to the BOD remaining, as can be represented by the simple differential equation

$$dL/dD = -k_1L$$

which integrates to

$$Le/Lo = e^{-k_1D}$$

in which Le and Lo are settled filter effluent and settled raw wastewater influent BOD, respectively, and may be expressed in any consistent and convenient units.* D is the depth of the filter and k_1 is the BOD removal rate constant in units of $(\text{distance})^{-1}$. Most of Velz's observations were at reasonably constant hydraulic loadings, hence the time the wastewater remained in the filter was directly proportional to filter depth.

Howland (9) recognized that liquid retention time in a filter was a function of both depth and hydraulic loading. Analyzing the flow of liquid over spheres, he demonstrated that liquid retention time was functionally related to hydraulic loading. For BOD removal he used the expression

$$Le/Lo = e^{-kt}$$

in which k is a constant in units of $(\text{time})^{-1}$, and t, the time the wastewater is in the filter, can be represented by

$$t = C \cdot D/Q^n$$

in which C = a constant related to the geometry of the filter media

n = a constant related to the type of flow over the media, i.e., laminar, turbulent or mixed.

For laminar flow Howland determined that n was equal to 2/3; for turbulent conditions, 1/3. It can also be shown that these exponents are appropriate for laminar and turbulent flow over inclined flat plates.

*In all rational models discussed in this report Lo refers to settled raw wastewater BOD, calculated as previously described.

Howland (12) also suggested a temperature correction factor for the rate constant k as follows:

$$k_t = k\theta$$

in which $\theta = (1.035)^{T-20}$.

Howland's model for removal of BOD in a trickling filter under laminar flow conditions without recirculation can be expressed as

$$Le/Lo = \exp\ (-k_t \cdot C \cdot D/Q^{2/3}). \qquad (5\text{-}4)$$

Schulze (14) tested Howland's model with a pilot trickling filter constructed of vertical screens and obtained reasonably good agreement.

Eckenfelder (17) modified Howland's equation to account for a decreasing amount of active slime surface with increased depth in a filter by including an exponent less than one on the depth term. He further modified the equation to account for a decrease in the ease of removal of the various wastewater constituents remaining with increasing depths in the filter, as shown below

$$Le/Lo = \exp\ (-x) = 1/(1 + x + x^2/2! + x^3/3! + ----).$$

Eliminating all but the first two terms in the series expression, a so-called retardant form is obtained, i.e.,

$$Le/Lo = 1/(1 + x). \qquad (5\text{-}5)$$

The general effect of the retardant form is shown in Figure 5-2.

Following statistical analysis of performance of stone-media filters, Eckenfelder proposed the following model:

$$Le/Lo = 1/(1+K \cdot D^{2/3}/Q^{1/2}). \qquad (5\text{-}6)$$

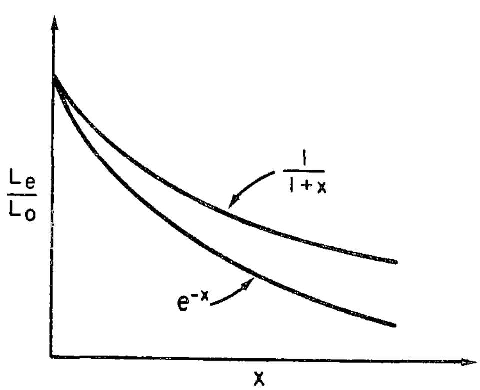


FIGURE 5-2 EFFECT OF RETARDANT MODEL

The factor K combines the rate constant and factors related to the geometry of the filter media. A value of 2.5 was suggested for stone-media filters.

Eckenfelder suggested that recirculation be treated as a dilution of filter influent. Assuming that filter effluent BOD is equal to Le when it has passed through either a primary or secondary settling tank, as illustrated in Figure 5-3, the following expression can be developed:

$$Lm = (Lo + Rr\ Le)/(1 + Rr) \tag{5-7}$$

in which Lm = BOD_5, mg/ℓ, of the mixture of settled raw sewage and settled recirculation flow leaving the primary settling tank.

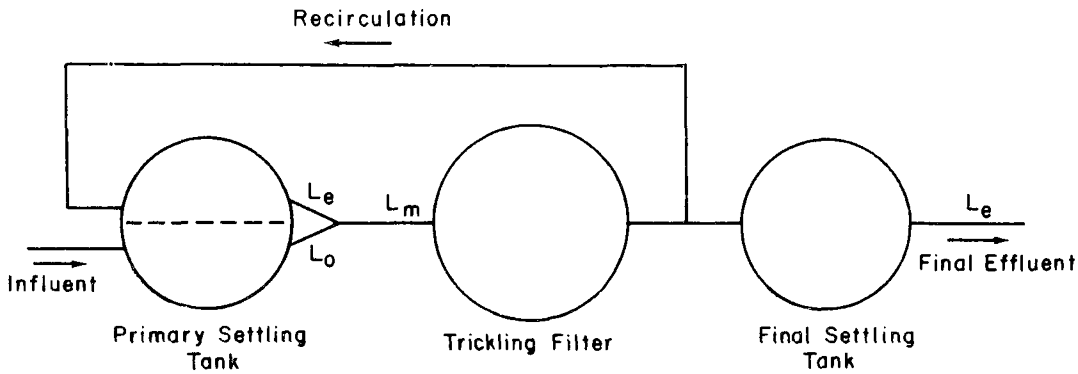


FIGURE 5-3 MIXTURE OF INFLUENT AND RECIRCULATION FLOWS

Substitution of Equation 5-7 in Equation 5-5, yields Le/Lm = 1/(1+x).

With some manipulation, the following relation may be obtained:

$$Le/Lo = 1/[1 + x\ (1 + Rr)] \tag{5-8}$$

in which $x = K \cdot D^m/Q^n$.

It is the writers' belief that models of the type represented by Equation 5-8 merit further development. The effect of specific surface area of the filter media can easily be included. The effect of turbulence in enhancing transfer of organics to the slime layers and the effect of periodicity of wastewater dosage call for further investigation. Nevertheless, further development of the type of models suggested by Howland and Eckenfelder seems to offer the best possibility of increased understanding of trickling filter performance.

An equation in the form of 5-8, in which a temperature correction factor (T^{α}) was included, was fitted to the Chapel Hill data using a nonlinear regression technique. The nonlinear method was selected, as all transforms devised to express the equation in linear form yielded unsatisfactory results.

The nonlinear program was developed in the Department of Biostatistics, School of Public Health, the University of North Carolina at Chapel Hill. Given the form of the function, with its parameters and variables, the program gives the values of the parameters which minimize the sum of the squares of the residuals (the residual is the difference between the observed value of the dependent variable and the value of the dependent variable predicted by the model of best fit). The program uses an iteration procedure similar to that described by Nelder and Mead (21). The same technique was used in fitting Equation 5-11 described later (the NRC formula).

The nonlinear regression analysis of the modified Eckenfelder model (Equation 5-8) yielded the following equation of best fit:

$$Le = Lo/[1 + 0.0055(1 + Rr)\ Q^{-0.38}\ T^{1.79}]. \qquad (5\text{-}9)$$

Equation 5-9 is not as different from the original Eckenfelder model as might appear at first inspection. If the actual value of $T^{1.79}$ at 20° C is included in the constant, the resulting expression is

$$Le = Lo/[1 + 1.17\ (1 + Rr)\ Q^{-0.38}].$$

b. Semi-rational Models

A well known semi-rational model is the NRC formula developed from extensive data collected at military installations during World War II (7). This model is as follows:

$$E = 1/[1 + 0.0085\ (W/VF)^{1/2}] \qquad (5\text{-}10)$$

in which E = the BOD removal efficiency of the filter and the final settling tank as a decimal fraction

W = lbs of settled raw wastewater BOD/day applied to the filter

V = the volume of the filter in acre-feet

F = the filter recirculation factor = $(1 + Rr)/(1 + Rr/10)^2$.

It should be noted that W/V is equivalent to Lo as previously described. Lo in turn is a product of influent flow and settled raw sewage BOD concentration. Hence to a certain extent the NRC formula includes factors related to organic loading, hydraulic loading and recirculation ratio. The application of the NRC formula for typical domestic wastewater has been questioned as it was developed from data obtained from the treatment of strong military-base sewage.

An expression in the form of Equation 5-10 was fitted to the Chapel Hill plant data using the nonlinear regression technique previously described. The resulting equation of best fit was

$$E = 1/[1 + 14.62(Lo/F)^{0.44} T^{-1.85}]. \qquad (5\text{-}11)$$

Another common semi-rational model was developed by Rankin and has been adopted for use in the Ten State Standards (22). For plants similar to Chapel Hill's, Rankin's method suggests that if the hydraulic loading on the filter is between 10 and 30 mgad the filter-final settling tank efficiency is strictly a function of the recirculation ratio. Actual hydraulic and organic loadings are not considered.

c. Comparison of the Models

A comparison of the regression Equation 5-3 and the modified forms of the Eckenfelder model (Equation 5-9) and NRC formula (Equation 5-11) was necessary to determine which relation provided the best fit to the Chapel Hill data. Because Equations 5-9 and 5-11 were determined by nonlinear regression methods it was impossible to find a value for the multiple correlation coefficient for these equations, so that a comparison of correlation coefficients was not possible. To make the desired comparison the three equations were all reduced to the general form Le/Lo = x by dividing both sides of the equation by Lo.

For Equation 5-3 the result is

$$Le/Lo = 9.84\ Lo^{-0.14}\ T^{-0.95}\ (1 + Rr)^{-0.84}\ Q^{0.56}. \qquad (5\text{-}12)$$

A plot of Le/Lo vs x, i.e., the entire right hand side of Equation 5-12, is shown in Figure 5-4. The plotted observed values of Le/Lo show a remarkable degree of scatter around the predictive line. The value of Equation 5-12 as a reliable predictor of daily plant performance is, therefore, quite dubious. When Equation 5-3 is analyzed, the sum of the squares of the differences between observed and predicted values of Le 1.142×10^7.

For Equation 5-9, the modified version of the Eckenfelder model, the Le/Lo = x form is

$$Le/Lo = 1/[1 + 0.0055(1 + Rr)\ Q^{-0.38}\ T^{1.79}]. \qquad (5\text{-}13)$$

A plot of the predicted and observed values of Le/Lo is shown on Figure 5-5. There is no apparent improvement in regard to the reliability of daily performance predictions based on this model. From the analysis of Equation 5-9, the sum of the squares of the difference between observed and predicted values of Le is 1.132×10^7.

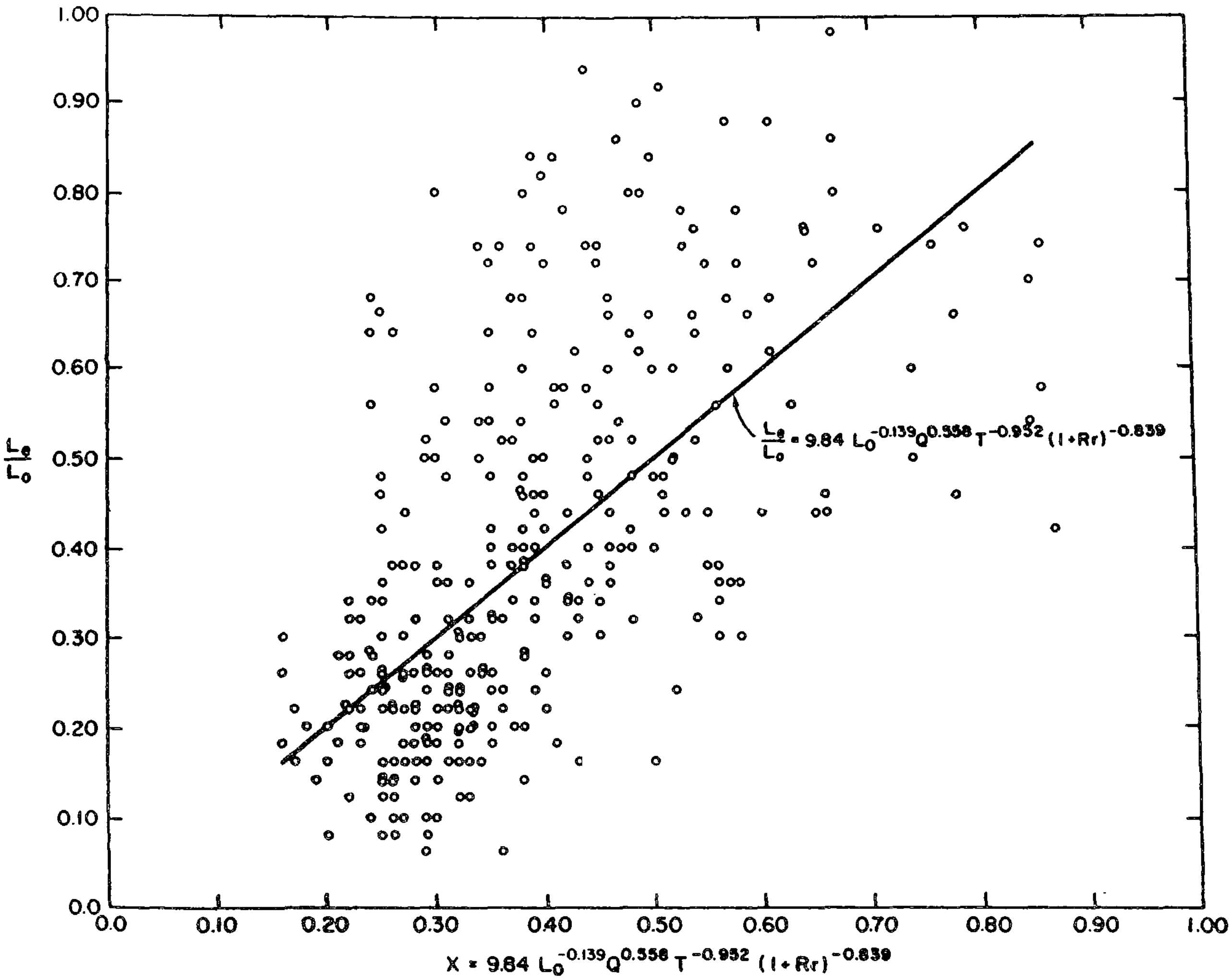


Figure 5-4. Scatter Diagram of Predictive Equation 5-12 Derived From Linear Regression Analysis.

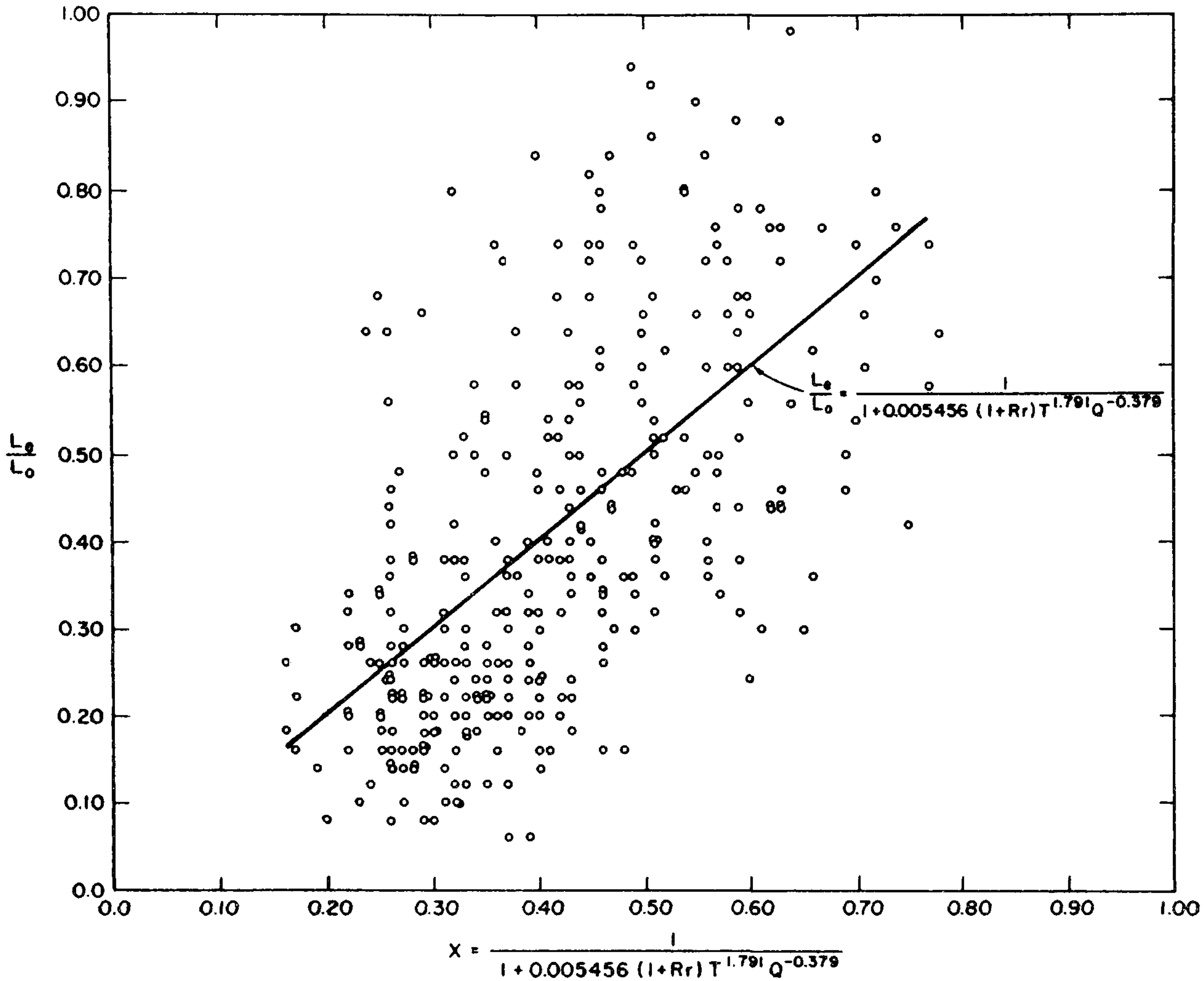


Figure 5-5. Scatter Diagram of Predictive Equation 5-13 in a Form Similar to Eckenfelder's Model.

For Equation 5-11, the modified version of the NRC formula, the Le/Lo = x form is

$$Le/Lo = 1 - 1/[1 + 14.62\ (Lo/F)^{0.44}\ T^{-1.85}] \qquad (5\text{-}14)$$

A plot of the predicted and observed values of Le/Lo is shown in Figure 5-6. Again the scatter of observed values around the predictive line is substantial. From the nonlinear regression analysis of Equation 5-11, the sum of the squares of the differences between observed and predicted values of Le is 1.230×10^7.

It is apparent that none of the filter performance models tested is very reliable as a predictor of daily plant performance. Also, the sum of the squared residuals is not sufficiently different for the three models to indicate that one is superior. All the models are useful in predicting average performance at the Chapel Hill plant over a long period of time during which operating conditions, daily wastewater flow and temperature are reasonably constant.

In the discussion of the effects of individual variables following, some general ideas are presented on how the reliability of filter performance might be enhanced in new designs.

3. Effect of Variables on Performance

Analysis of regression Equations 5-3, 5-9, and 5-11 as regards the effect of variation in individual variables, i.e., organic loading (Lo), hydraulic loading (Q), recirculation ratio (Rr), and temperature (T), provides some insight into relative importance of the variables as related to filter-final tank performance. Such an analysis was conducted using Equations 5-12, 5-13, and 5-14, in the manner described below.

In each of the three equations the values of the several variables were held constant at the mean value of the respective variable during the 329 cases in the experimental program. The variable under examination was then changed incrementally and the effect on BOD remaining (Le/Lo) was calculated.

Mean values of the 329 experimental cases are as follows

Lo = 850 lbs BOD/day/acre-foot
T = 21.2° C
(1+Rr) = 3.53
Q = 15.93 mgad (influent flow + recirculation flow)
I = 4.43 mgad (influent flow).

1) Effect of Organic Loading, Lo

Using the values above for all variables except Lo, the several equations reduce to the following forms:

Equation 5-12, linear regression model --

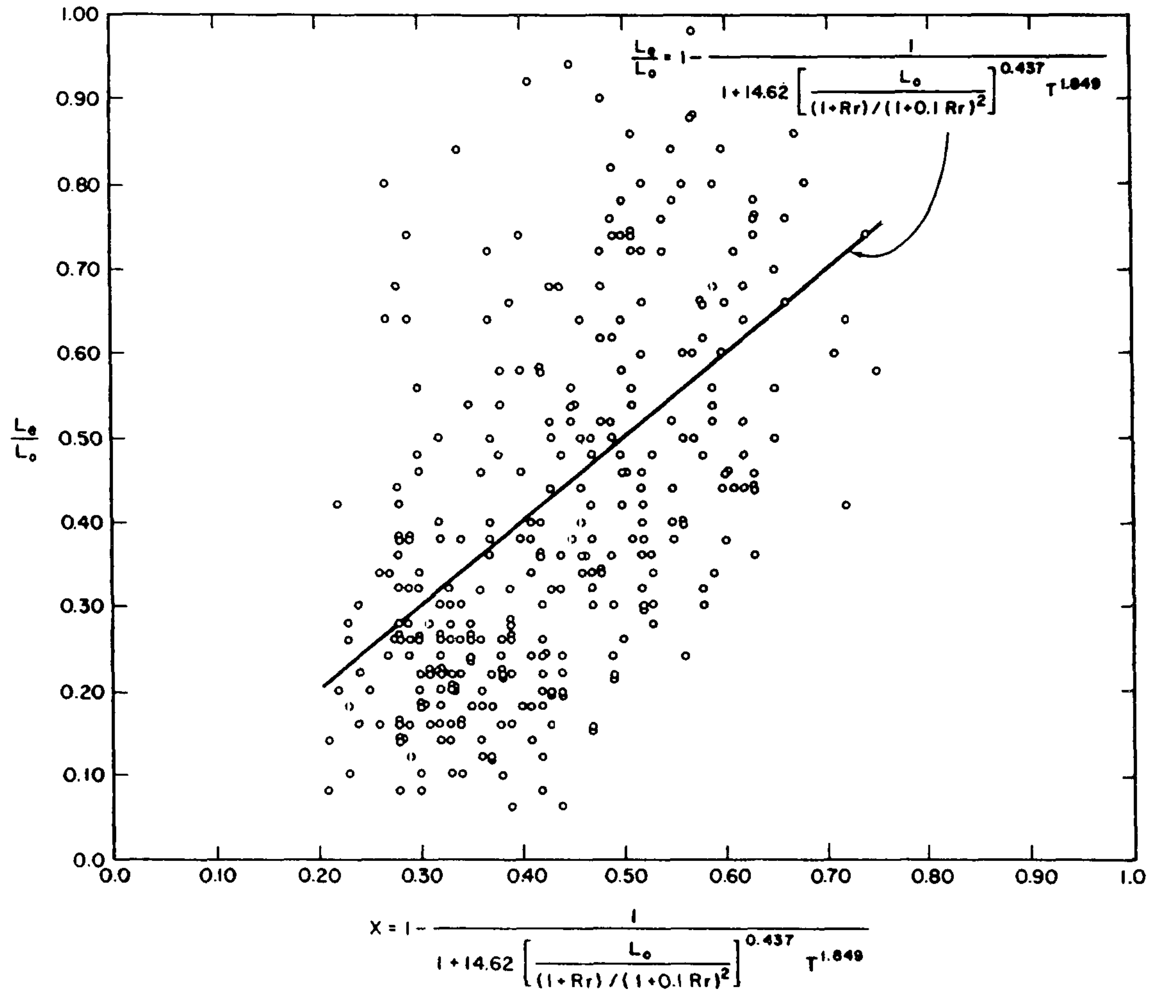


Figure 5-6. Scatter Diagram of Predictive Equation 5-14 in the General Form of the NRC Formula.

$$Le/Lo = 0.874 \cdot Lo^{-0.14}.$$

Equation 5-13, nonlinear regression model of modified Eckenfelder-type equation --

$$Le/Lo = 0.383,$$ i.e., organic loading has no effect.

Equation 5-14, nonlinear regression model of modified NRC equation --

$$Le/Lo = 1 - 1/(1 + 0.0362\ Lo^{0.44}).$$

The calculated effects on Le/Lo resulting from variation in Lo are shown in Table 5-3 and on Figure 5-7.

As can be seen the three models predict entirely different effects as a result of variations in organic loading. The writers are inclined to favor the results produced by Equations 5-12 or 5-13 over those of Equation 5-14. As Equation 5-12 was developed with unbiased linear regression techniques it may be closest to the truth. The lower removals at low organic loadings predicted by Equation 5-12 may possibly indicate that the slime layers in the lower section of the filter were receiving too little organic material to maintain the same adsorptive capacity as slime layers located higher in the filter.

2) Effect of Temperature

The three equations reduce to the following forms in terms of temperature, T, when all other variables are held constant at mean values:

Equation 5-12, linear regression model --

$$Le/Lo = 6.27\ T^{-0.95}.$$

Equation 5-13, nonlinear regression model of modified Eckenfelder-type equation --

$$Le/Lo = 1/(1 + 0.0067\ T^{1.79}).$$

Equation 5-14, nonlinear regression model of modified NRC equation--

$$Le/Lo = 1 - 1/(1 + 195.6\ T^{-1.85}).$$

The calculated effects of Le/Lo resulting from variations in temperature are shown in Table 5-4 and on Figure 5-8.

As can be seen in Figure 5-8, all three models show a similar and pronounced effect on filter-final settling tank efficiency due to changes in wastewater temperature. The effect may be partly due to a gradual change in activity of filter biota with temperature. On the other hand, it was observed that reasonably high efficiency was maintained even

TABLE 5-3

EFFECTS OF VARIATIONS IN LO ON FILTER-FINAL SETTLING TANK PERFORMANCE

Lo	Le/Lo		
	Eq. 5-12	Eq. 5-13	Eq. 5-14
300	0.396	No effect	0.304
400	0.380		0.332
500	0.368		0.354
600	0.359		0.372
700	0.352		0.388
800	0.345		0.402
900	0.340		0.414
1000	0.335		0.426
1100	0.330		0.436
1200	0.326		0.445
1300	0.322		0.454
1500	0.316		0.469
1800	0.308		0.489
2000	0.304		0.501
2500	0.295		0.525
3000	0.287		0.545
4000	0.276		0.576

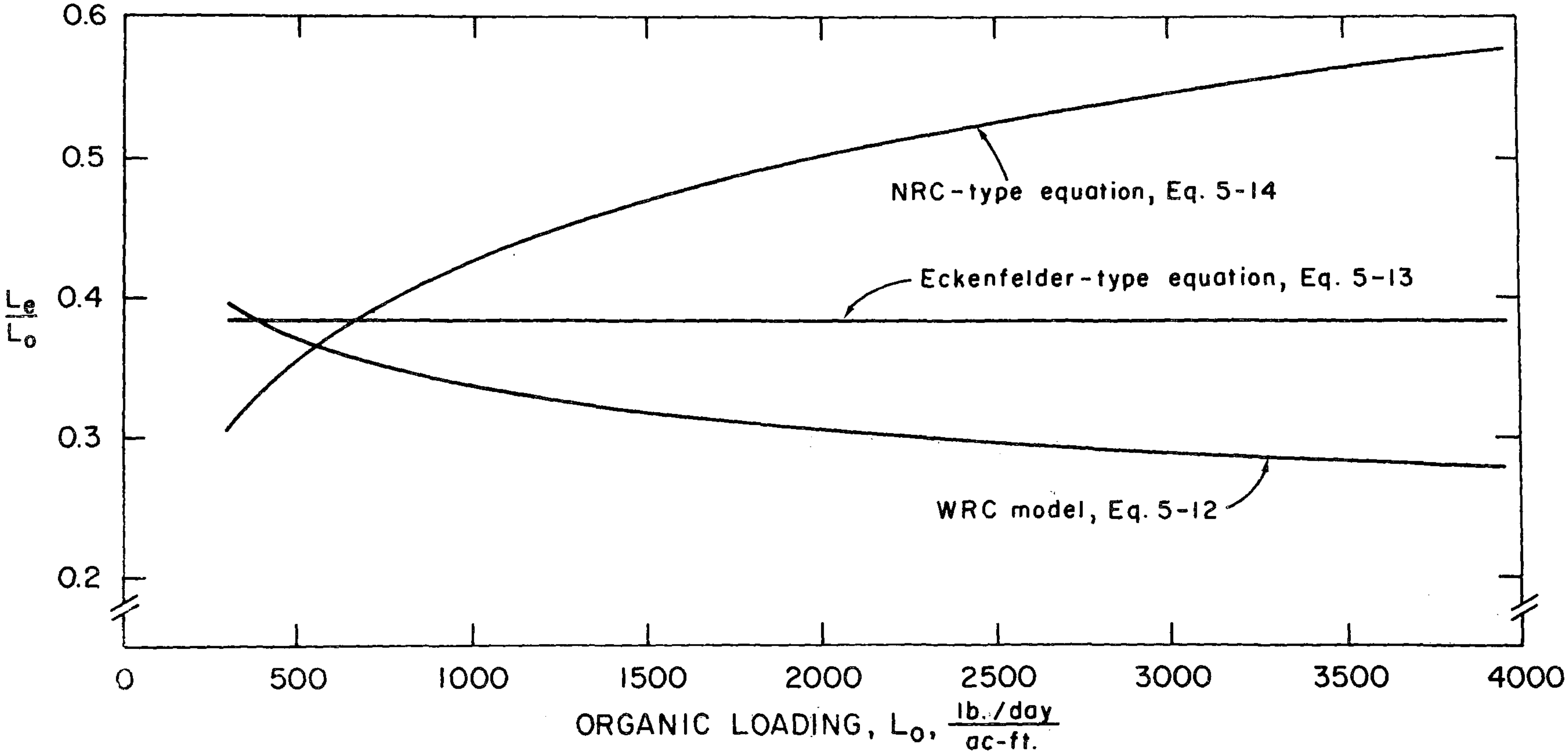


FIGURE 5-7. EFFECT OF ORGANIC LOADING ON FRACTION OF BOD REMAINING.

TABLE 5-4

EFFECTS OF WASTEWATER TEMPERATURE ON FILTER-FINAL SETTLING TANK PERFORMANCE

	Le/Lo		
	Eq. 5-12	Eq. 5-13	Eq. 5-14
14	0.510	0.568	0.598
15	0.476	0.537	0.567
16	0.447	0.508	0.537
17	0.422	0.481	0.509
18	0.400	0.456	0.483
19	0.380	0.432	0.458
20	0.362	0.409	0.435
21	0.345	0.388	0.413
22	0.330	0.369	0.392
23	0.317	0.350	0.372
24	0.304	0.333	0.354
25	0.293	0.317	0.337
26	0.282	0.302	0.321

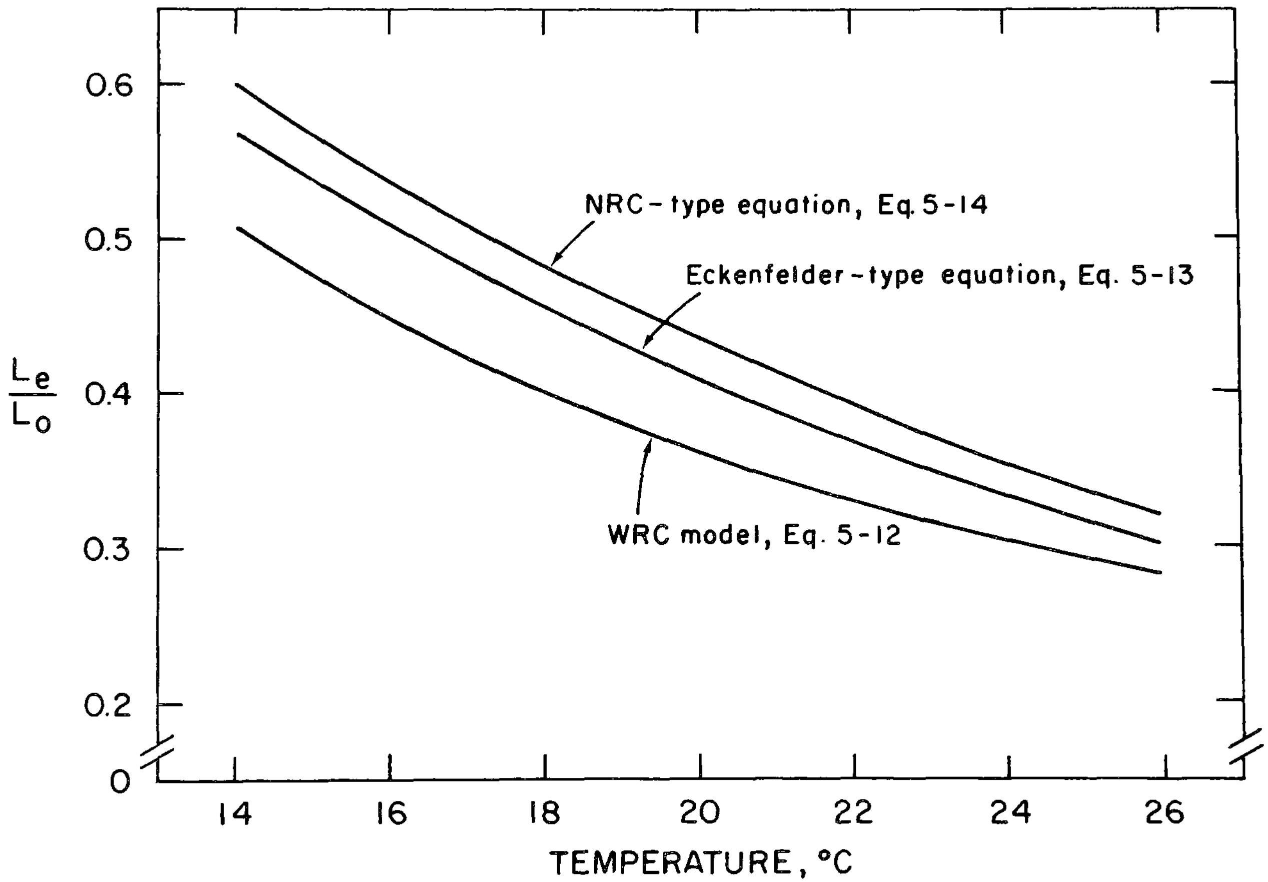


FIGURE 5-8. EFFECT OF TEMPERATURE ON FRACTION OF BOD REMAINING.

after wastewater temperatures had declined in the fall. Furthermore, lower efficiences typical of winter operation often persisted after wastewater temperatures had significantly increased in the late spring. Inspection of the filters revealed that lower efficiencies were coincidental with the accumulation of inert humus-like material in the filter media. This accumulation appeared to be related to the density of the filter fly larvae populations in the filters (23) and was rapidly dislodged with the reappearance of larvae in the late spring. The enhancement of filter performance during periods of increased larval activity has also been noted in Britain (24). Although all of the predictive equations analyzed indicate a pronounced temperature effect, the fact that changes in filter efficiency lag significantly behind the changes in wastewater temperature is not accounted for. This effect partially accounts for the high degree of scatter in observed and predicted values of Le/Lo.

One might speculate that the predictability of filter performance, and perhaps performance itself, could be enhanced with the use of filter media designed to minimize the possibilities for the accumulation of humus-like materials.

3) Effect of Hydraulic Loading

With all variables except hydraulic constant at mean experimental levels, the three equations reduce to the following forms:

Equation 5-12, linear regression model --

$$Le/Lo = 0.073\ Q^{0.56}.$$

Equation 5-13, nonlinear regression model of modified Eckenfelder-type equation --

$$Le/Lo = 1/(1 + 4.573\ Q^{-0.38}).$$

Equation 5-14, nonlinear regression model of modified NRC equation--

$Le/Lo = 1 - 1/1 + 0.686$, i.e., hydraulic loading has no effect.

The calculated effects on Le/Lo resulting from variations in hydraulic loading are shown in Table 5-5 and on Figure 5-9.

TABLE 5-5

EFFECT OF HYDRAULIC LOADING ON FILTER-FINAL SETTLING TANK PERFORMANCE

Q (mgad)	Le/Lo		
	Eq. 5-12	Eq. 5-13	Eq. 5-14
4	0.158	0.270	No effect
6	0.198	0.301	
8	0.233	0.325	
10	0.264	0.344	
12	0.292	0.359	
14	0.318	0.373	
16	0.343	0.385	
18	0.366	0.395	
20	0.389	0.405	
22	0.410	0.414	
24	0.430	0.422	
26	0.450	0.429	
28	0.469	0.436	
30	0.487	0.442	

It is obvious that hydraulic loading has a significant effect on filter-final settling tank performance. The apparent zero-effect in Equation 5-14 is simply an artifact of the model, i.e., no Q term is directly included in the model.

4) Effect of Recirculation Ratio

An increase in recirculation ratio (Rr) also increases the hydraulic loading (Q). Assuming a constant influent flow (I) the effect of changes in the recirculation ratio may be analyzed by making a simple algebraic transformation in the equations as outlined below:

$$Rr = \frac{\text{recirculation flow (Rf)}}{\text{influent flow (I)}}$$

or Rf = Rr I

$$Q = Rf + I = RrI + I = I(1 + Rr).$$

In Equations 5-12 and 5-13, the terms Rr and Q are in the form $(1 + Rr)^x Q^y$ which is seen to be equivalent to $(1 + Rr)^x I^y$ or $(1 + Rr)^{x+y} I^y$. With all variables with the exception of Rr held constant at the mean experimental levels, the three equations reduce to the following forms:

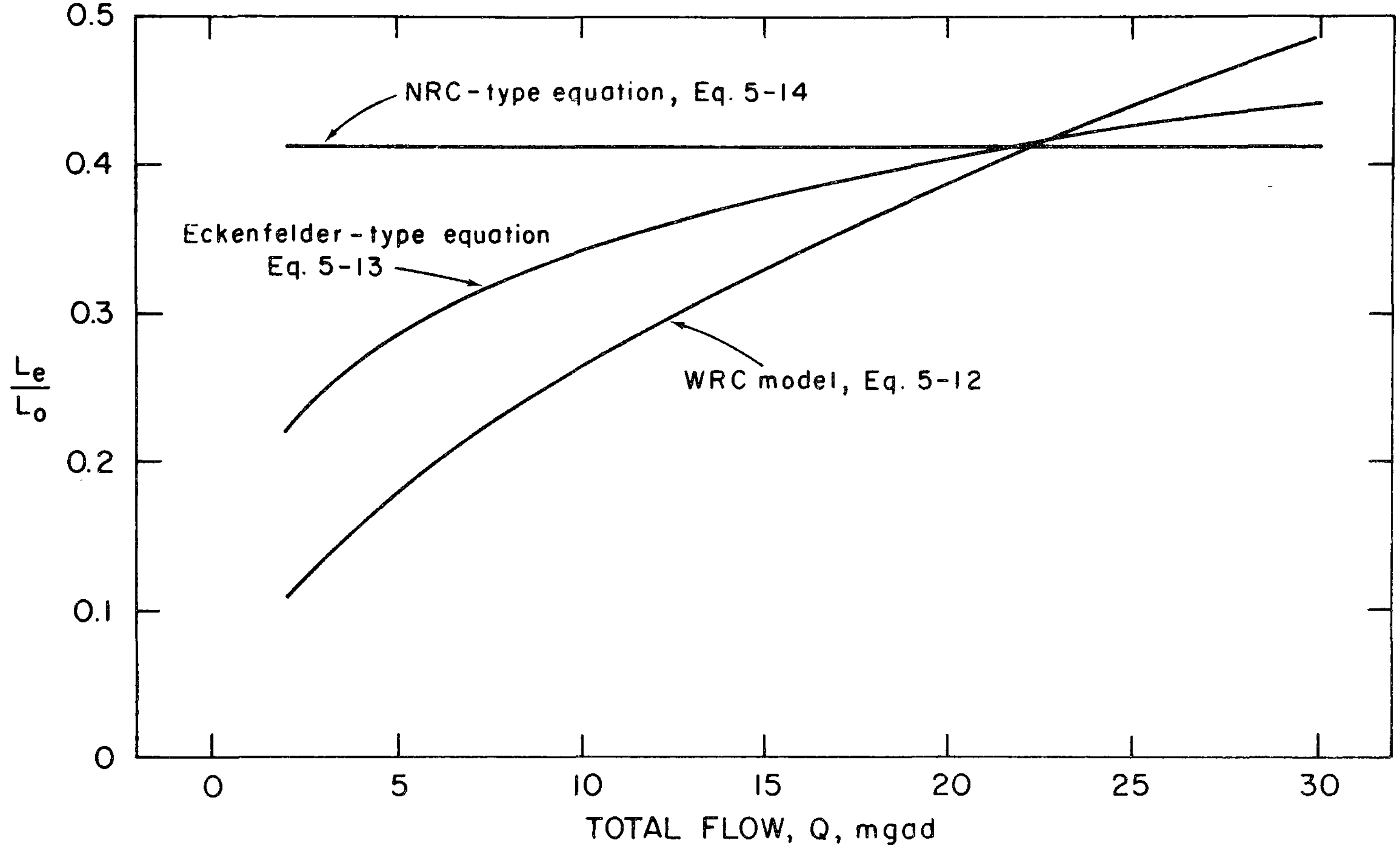


FIGURE 5-9. EFFECT OF TOTAL FLOW Q, ON FRACTION OF BOD REMAINING.

Equation 5-12, linear regression model --

$$Le/Lo = 0.483\ (1 + Rr)^{-0.28}.$$

Equation 5-13, nonlinear regression model of the modified Eckenfelder-type equation --

$$Le/Lo = 1/[1 + 0.737\ (1 + Rr)^{0.62}].$$

Equation 5-14, nonlinear regression model of the modified NRC equation --

$$Le/Lo = 1 - 1/\{1 + 0.983\ [(1 + Rr)/(1 + 0.1\ Rr)^2]^{-0.44}\}.$$

The calculated effects on Le/Lo resulting from variations in recirculation ratio are shown in Table 5-6 and on Figure 5-10.

TABLE 5-6

EFFECTS OF RECIRCULATION RATIO ON FILTER-FINAL SETTLING TANK PERFORMANCE

	Le/Lo		
Rr	Eq. 5-12	Eq. 5-13	Eq. 5-14
0.0	0.483	0.576	0.496
0.5	0.431	0.513	0.462
1.0	0.398	0.468	0.441
1.5	0.373	0.434	0.427
2.0	0.355	0.407	0.416
2.5	0.340	0.384	0.409
3.0	0.327	0.365	0.403
3.5	0.316	0.348	0.398
4.0	0.307	0.333	0.395
4.5	0.299	0.320	0.392
5.0	0.292	0.308	0.390

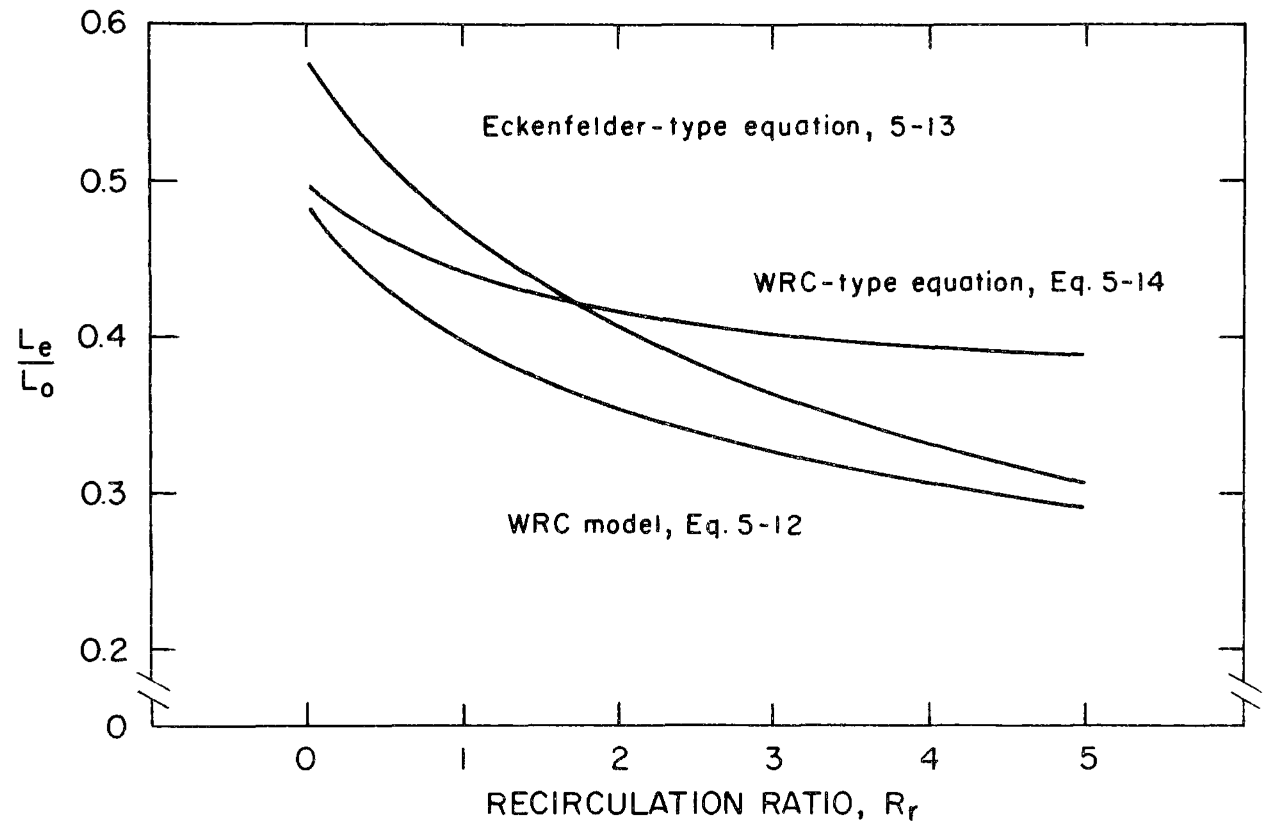


FIGURE 5-10. EFFECT OF RECIRCULATION RATIO ON FRACTION OF BOD REMAINING.

The beneficial effect of recirculation is clearly apparent in the above analysis. All models tested yield an improved removal with increasing recirculation ratios. Equation 5-13 produces the greatest increase in efficiency with increased recirculation. Equation 5-14 is the least sensitive. The unbiased linear regression model (Equation 5-12) more or less parallels Equation 5-13. These results indicate that fairly high recirculation ratios, i.e., at least equal to 3.0 and possibly higher, provide significant improvements in filter-final tank removal efficiency. This is true even though higher recirculation flows result in higher hydraulic loading, which considered alone, with recirculation ratios constant, tends to result in lower efficiencies.

G. PILOT PLANT STUDIES OF TWO-STAGE FILTRATION

1. Description of Pilot Trickling Filters

Two pilot trickling filter plants were constructed during 1966 prior to the initiation of the work reported here. Two additional trickling filter pilot plants were constructed during the course of this study. The plants were designed to treat raw Chapel Hill sewage which had passed through the main plant bar rack, a degritting chamber, and a fine bar rack to remove stringy solids which would tend to clog the small pumps and pipes in the pilot plant. Influent to the pilot plant was delivered through a 2-inch plastic pipe at a flow rate substantially in excess of pilot plant requirements. Excess flow was wasted. The required amount of pilot plant influent was delivered to the operating units by means of a variable speed pump with D.C. motors regulated by silicon controlled rectifiers. Flow to each of the pilot units was proportioned with the use of an overhead rotating distributor discharging into a circular distribution box with four equal radial sectors. Flow was by gravity from the distribution box to the primary settling tank of each pilot plant.

Each pilot plant unit consisted of a primary settling tank, a trickling filter, and a final settling tank. Recirculation was provided around the filters through the primary settling tank. A general flow diagram of a single pilot plant unit for single-stage filtration operation is shown in Figure 5-11.

The sizes of the settling tanks and filters were selected to provide detention time and, in the case of the filters, a hydraulic loading about the same as experienced in the main plant at a flow rate of 3 mgd. As the pilot settling tanks were not as deep as the main plant units, the surface overflow rate in the pilot units was substantially less than those in the main plant. All settling tanks were equipped for hydrostatic sludge removal.

The filters were designed to operate under conditions similar to those of the main plant filters. A filter diameter of four feet was selected, this being considered reasonably safe for minimizing wall effects. Conventional clay tile filter underdrains were used. Filter media depth

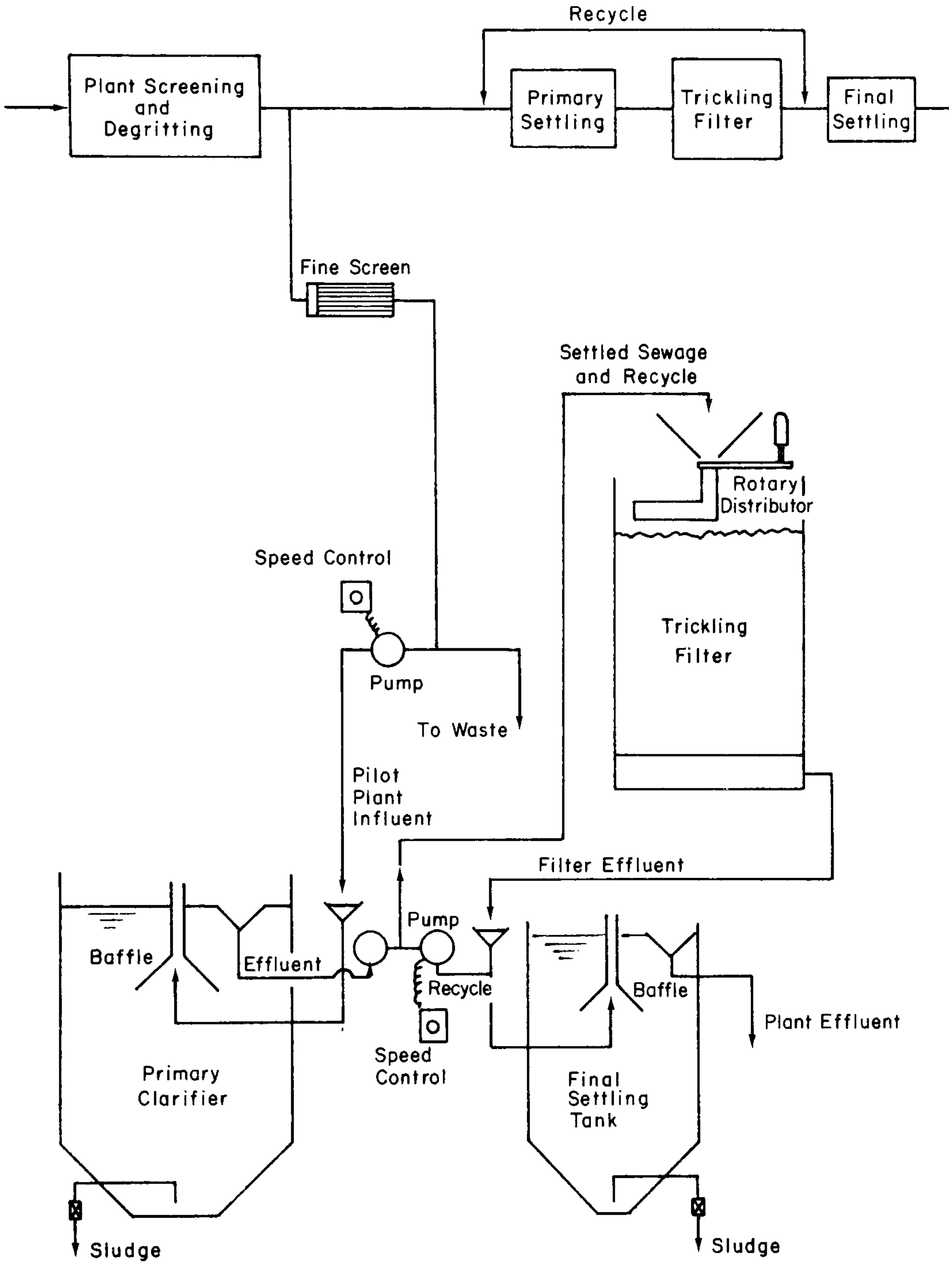


FIGURE 5-11. FLOW DIAGRAM OF PILOT TRICKLING FILTER FOR SINGLE STAGE FILTRATION.

was fixed at 4'0". Inner and outer walls of the filters consisted of two vertical concentric sections of Armco steel pipe, six feet long and 48 and 54 inches in diameter respectively. The annular space between the inner and outer pipes provided insulation to reduce heat loss during cold weather operation. Filter media was granite stone selected to meet the specifications of the N. C. stream pollution control authorities requiring that it pass a 3.5" screen with less than 75% passing a 2.5" screen.

Design conditions for the various plant units are given in Table 5-7 below:

TABLE 5-7

DESIGN CONDITIONS FOR PILOT TRICKLING FILTER UNITS

	Flow (gpm)	Detention Time (hrs)	Overflow Rate (gpd/ft^2)	Hydraulic Loading (mgad)
Primary Settling Tank	3.6	1.8	470	---
Filter	3.6	---	---	18.0
Final Settling Tank	1.2	2.0	436	---

On the basis of an influent BOD of 180 mg/ℓ and 35% removal in the primary settling tanks, the organic loading on the filters calculates to be approximately 1500 lbs BOD per acre-foot per day.

Early in the experimental work with the trickling filter pilot plants all four pilot plant units were found to provide comparable performance under identical loading conditions.

2. A Comparison of Single- and Two-Stage Operation with Pilot Trickling Filters

Various authors and groups (4, 7, 8, 25, 26) have presented information suggesting that it is economical to utilize two-stage trickling filtration. Two-stage or series operation has been indicated to provide a higher degree of treatment than a single filter of equal volume. The substantiation of these claims for a typical domestic waste such as Chapel Hill's would have significant implication for the designer of any treatment plant in which more than one filter was necessary because of mechanical considerations or required by design or regulatory standards.

Because of the flow control problems in the Chapel Hill main plant, single- versus two-stage experiments were conducted in the pilot trickling filter units. The mode of operation was selected to be similar to that which would occur in the main plant if all influent flow was treated through one primary tank, then through one filter with recirculation through the primary. Effluent from the first stage filter would be passed through the secondary primary tank, which, in such case, would be acting as an intermediate settling tank. Wastewater would then pass through the second stage filter with recirculation directly around the filter. Second stage filter effluent would pass through the secondary clarifiers prior to discharge.

Three of the pilot trickling filter units were operated as shown in the flow diagram in Figure 5-12 during the period from May 16, 1972 through July 13, 1972.

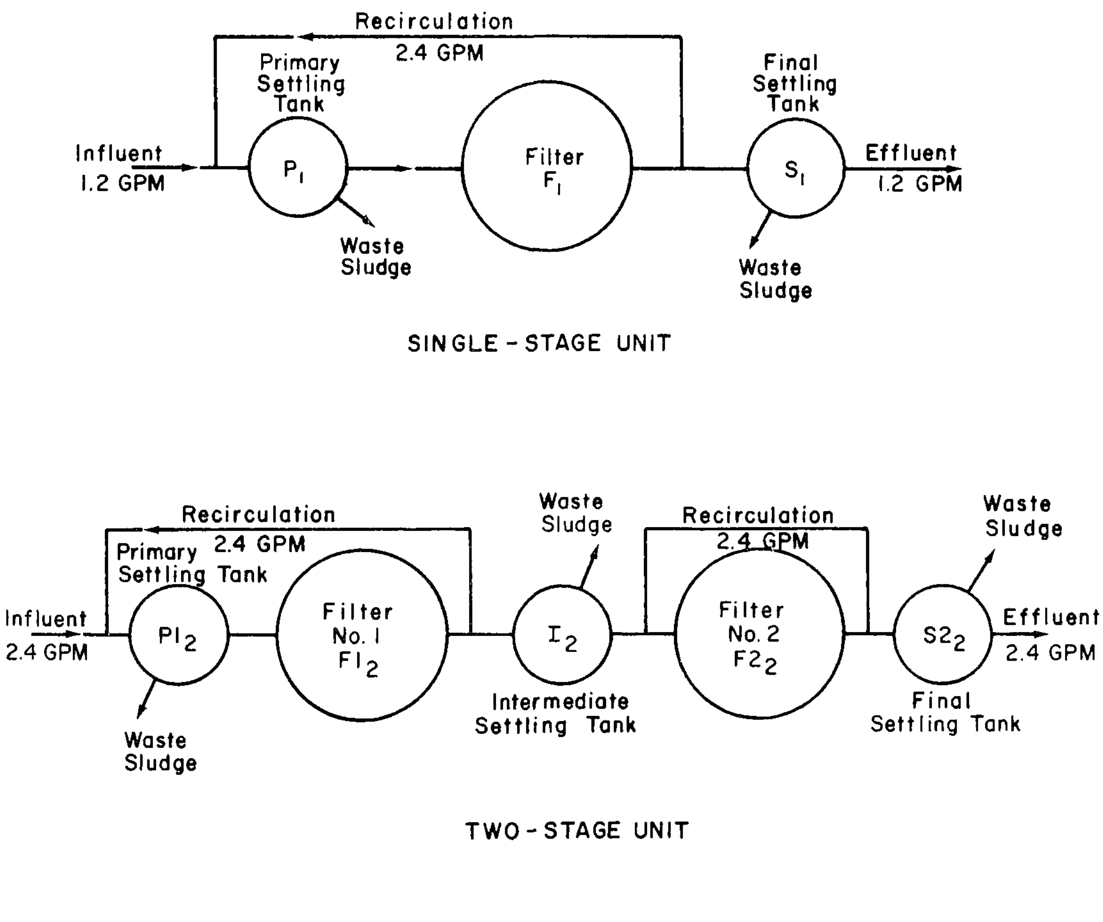


FIGURE 5-12. FLOW DIAGRAM OF SINGLE-STAGE AND TWO STAGE UNITS.

During the single-stage versus two-stage filtration experiments, the influent flow to the single-stage unit was held at 1.2 gpm and the recirculation flow was maintained at 2.4 gpm. Influent flow to the two-stage unit was set at 2.4 gpm. This is double the flow to the single-stage unit as the objective of the experiment was to estimate the effect of converting the Chapel Hill plant to two-stage operation in which case the entire plant influent would pass in sequence through the two filters rather than being split into equal portions for single-stage treatment through parallel units. Recirculation flow around each of the filters in the two-stage unit was held at 2.4 gpm, the same as in the single-stage unit. The decision to hold the recirculation flows to 2.4 gpm in the two-stage pilot unit was based on the fact that recirculation pumping capacity in the main plant is limited and if the main plant were converted to two-stage it seemed unlikely that the pumping capacity would be increased. With the recirculation flow as described the recirculation ratios were 2.0 in the single-stage pilot unit and 1.0 in the two-stage unit.

Hydraulic loadings or detention times of the various process units are tabulated below:

Single-Stage Unit (influent flow 1.2 gpm)			Two-Stage Unit (influent flow 2.4 gpm)		
Unit	Flow (gpm)	Detention Time or Loading	Unit	Flow (gpm)	Detention Time or Loading
Pri. Sett. Tank	3.6	1.8 hrs.	Pri. Sett. Tank	4.8	1.4 hrs.
Filter	3.6	18.0 mgad	Filter No. 1	4.8	23.9 mgad
Sec. Sett. Tank	1.2	2.0 hrs.	Int. Sett. Tank	2.4	1.0 hrs.
			Filter No. 2	4.8	23.9 mgad
			Sec. Sett. Tank	2.4	2.7 hrs.

These loadings and detention times correspond to normal values in full scale high rate trickling filter plants treating typical domestic sewage.

The organic loading on the filters was calculated on the basis of lbs of settled raw sewage BOD per day per acre-foot of filter volume. BOD removal in the primary settling tank unit was estimated to be 35 percent in the single-stage unit and 30 percent in the primary tank of the two-stage unit. Estimated average organic loading on the filters during the course of this experiment was as follows:

Single-Stage Filter	1500 lbs	BOD/day/acre-feet*
First Filter in Two-Stage Unit	3200 lbs	BOD/day/acre-feet*
Second Filter in Two-Stage Unit	1300 lbs	BOD/day/acre-feet**

*settled raw sewage BOD
**intermediate settling tank effluent BOD

The organic loadings on all filters, both single- and two-stage, were within the range normally observed for high rate trickling filters treating domestic wastewater.

During the single- versus two-stage filtration investigation, samples were taken each half hour with a multitube sampling pump controlled by a timer. Samples were taken of influent and final effluent from the single-stage unit. Samples of influent, first stage effluent (intermediate settling tank effluent) and second stage effluent (final settling tank effluent) were obtained from the two-stage unit. Daily composite samples were obtained every Tuesday, Thursday, and Sunday during the experimental period. The daily sampling started at 8 a.m. and terminated at 8 a.m. the following morning at which time the accumulated samples were taken to the laboratory for analysis. During collection, the samples were accumulated in plastic jerry cans and stored at a temperature of 4° C. All samples were analyzed for suspended solids, organic carbon and BOD. A summary of the results of the investigation is shown in Table 5-8.

TABLE 5-8

SUMMARY RESULTS OF SINGLE- VERSUS TWO-STAGE TRICKLING FILTRATION

		Two-Stage Filtration			Single-Stage Filtration	
	Infl. (mg/ℓ)	1st. Stage Eff. (mg/ℓ)	Final Eff. (mg/ℓ)	% Removal	Final Eff. (mg/ℓ)	% Removal
Susp. Solids	247	32	18	92.7	36	85.3
Org. Carbon	156	44	26	83.4	41	73.7
BOD	179	51	23	87.2	36	79.8

These results indicate a clear advantage for two-stage filtration as compared with the more conventional single-stage process. As indicated in Table 5-9 in the following part of this section, the improved efficiency cannot be accounted for by the greater detention time in the final settling tank in the two-stage unit. The economic advantage of two-stage filtration may be illustrated by way of an example based on the experimental results.

Using the mean BOD removals found for single-stage filtration and assuming a 35 percent removal of BOD in the primary settling tank, an appropriate constant may be determined for the NRC formula.

From the formula for the overall efficiency of two processes in series the required efficiency of the second stage process can be calculated if the overall and first stage efficiencies are known. From

$$E_{oa} = E_p + E_f \ (1 - E_p)$$

one obtains

$$E_f = E_{oa} - E_p/(1 - E_p) \tag{5-15}$$

in which

E_{oa} = overall efficiency
E_p = primary settling tank efficiency
E_f = filter-final settling tank efficiency.

Substituting the assumed value for E_p and the observed overall single-stage filtration efficiency for E_{oa}

$$E_f = 0.798 - 0.350/(1 - 0.350) = 0.69 \ (69\%).$$

If 69% is accepted for filter-final settling tank efficiency under loadings as maintained in the single-stage filtration pilot plant, a new constant term can be obtained for the NRC formula which will be in accord with the calculated efficiency.

From

$$E_f = 1/[1 + C_1(W/VF)^{0.5}]$$

with rearrangement one may obtain

$$C_1 = (1 - E_f)/[E_f(W/VF)^{0.5}].$$

The value of W/V from the single-stage experiments is 1500 lbs settled raw sewage BOD per day per acre-foot. The value of F for the recirculation ratio of 2.0 is 2.08. Therefore the calculated value of C_1 required for NRC formula agreement with observed results is

$$C_1 = 1 - 0.69/0.69(1500/2.08)^{0.5} = 0.0167.$$

From the results of the experimental program it may be assumed that in a plant with two equal sized filters operating in parallel at loadings equal to those in the pilot plant, overall BOD removal efficiency might be increased from 79.8% to 87.2% by converting to series operation without change in the size of the various units. On the other hand, if the same increase in efficiency is to be obtained by the addition of single-stage filters, the required increase in filter volume may be estimated using the NRC formula. The single-stage filter-final settling tank efficiency required for an overall efficiency of 87.2%, given that the primary tank removal is 35%, may be calculated using Equation 5-15 as follows:

$$E_f = (0.872 - 0.350)/(1 - 0.650) = 0.80 \ (80\%).$$

As the total lbs of raw settled BOD (W) applied to the filters has not changed, an estimate of the increased single-stage filter volume may be obtained by calculating a value for W/V which will provide the required removal and comparing this value with 1500 (the single-stage filter loading that resulted in an overall removal of 79.8%). To calculate the required value of W/V for 80% filter-final settling tank efficiency the NRC formula may be rearranged as follows:

$$W/V_2 = [(1 - E_f)(F)^{0.5}/E_f \cdot C_1$$

and solving for W/V_2 for an 80% filter-final settling tank efficiency

$$W/V_2 = [(1 - 0.80)(2.08)^{0.5}/0.80 \cdot 0.0167]^2 = 445.$$

As W is a constant, i.e., the total lbs of settled raw BOD applied to the filter has not changed, it can be seen that for overall efficiency of 87.2%, $W = V_2 \times 445 = V \times 1500$. Therefore, $V_2 = V \cdot 1500/445$, i.e., the volume of single-stage filters required by the modified NRC formula for the desired improvement in removal is over three times the original.

The lack of reliability of the NRC formula and other mathematical models for predicting trickling filter performance has been demonstrated earlier. The use of any formula in calculations such as those above may be questioned. Regardless of formula deficiencies, the significant improvement which can be obtained in overall plant performance by operating trickling filters in series has been demonstrated in the pilot plant investigation. In most trickling filter treatment plants, at least two filters are provided. A design which provides for stage operation of the filters will add slightly to the initial plant cost, but the cost of adding additional single-stage filter volume to produce an equivalent efficiency will be substantially greater.

3. Rationale for Improved Efficiency in Two-Stage Filtration

The improved removal of BOD in two-stage filtration may result from the fact that as the hydraulic loading on a filter is increased the actual detention time of the wastewater in the filter does not proportionately decrease. If it is assumed that both laminar and turbulent flow conditions exist in the flow over filter, media it is not unreasonable to assume that detention in the filter is roughly proportional to $D/Q^{0.5}$ (as implied in Eckenfelder's modification of Howland's equation). Table 5-9 was developed to illustrate the relative effect on filter detention time of variations in D and Q.

TABLE 5-9

RELATIVE DETENTION TIME IN FILTER

		Relative Depth				
Q	$Q^{0.5}$	4	8	12	16	20
1	1.00	4.00	8.00	12.0	16.0	20.0
2	1.41	2.84	5.68	8.51	11.3	14.2
3	1.73	2.31	4.52	6.94	9.25	11.5
4	2.00	2.00	4.00	6.00	8.00	10.0
8	2.83	1.41	2.83	4.25	5.66	7.07

As Table 5-9 shows, doubling the hydraulic loading does not halve the detention time. In the pilot plant experiments the hydraulic loading on the single-stage unit was 3.6 gpm which included 1.2 gpm of influent flow and 2.4 gpm of recirculation flow. Relative detention time in this unit can be calculated as $[4/(3.6)^{0.5}](1 + Rr)$, where Rr = 2.0. The result is 6.31. The term (1 + Rr) must be included as the water actually passes through the filter an average of (1 + Rr) times. In the two-stage pilot plant the hydraulic loading on each stage was 4.8 gpm which included 2.4 gpm of influent flow and 2.4 gpm of recirculation flow. The total depth of filter media in this case was 8 feet. The total relative detention time in the two-stage unit is $[8/(4.8)^{0.5}](1 + 1)$ or 7.29. If the recirculation ratio has been maintained at 2.0, as in the single-stage unit, the relative detention time in the two-stage unit would have been 8.43.

Increasing the specific surface area of filter media affects the time of liquid detention in a filter exactly the same as decreasing the hydraulic loading in the same proportion as the specific surface area is increased. For example, doubling the specific surface area while the areal hydraulic loading remains constant halves the actual liquid flow over each unit of media surface. With detention time the proportional to $1/Q^{0.5}$, detention time is increased by a factor of 1.41.

It can be seen that two-stage filtration with two filters of equal depth is comparable to filtration through one filter of twice the depth as the stage filters, i.e., the liquid detention time in the filter is doubled. In addition, increasing the specific surface area of the filter media is analogous to decreasing the hydraulic loading as it affects detention time. The overall effect on liquid detention time due to filter depth, recirculation ratio, and specific surface area of filter media is illustrated in the following, rather extreme examples:

Case 1. Influent flow 1 mgd; filter area 0.25 acres; filter depth 4 feet; no recirculation; relative specific surface area of filter media = 1. $Q = 1/0.25 = 4$ mgad.
<u>Relative Detention Time</u> $= D/Q^{0.5} = 4/4^{0.5} = \underline{2.0}$.

Case 2. Influent flow 1 mgd; filter area 0.05 acres; filter depth 20 feet; recirculation flow 1.2 mgd; relative specific surface area of filter media = <u>2</u>.
$Q = (1 + 1.2)/0.5 = 44$ mgad - this is the maximum hydraulic loading listed for high rate filters in WPCF Manual of Practice No. 8 (4).
<u>Relative Detention Time</u> $= D/(Q/2)^{0.5}(1 + Rr)$

$$= 20/(44/2)^{0.5}(1 + 1.2) = \underline{9.37}.$$

Factors other than liquid detention time can have significant effects on filter performance. Nevertheless, implications drawn from the two-stage pilot filter results and the detention time calculations above indicate the need to re-examine conventional design criteria which have led to shallow filters operated at relatively low hydraulic loadings and recirculation ratios.

H. ANALYSIS OF MAIN PLANT FINAL SETTLING TANK PERFORMANCE

At the Chapel Hill plant filter effluent contains a large fraction of suspended solids which are so finely divided that they do not settle well at the overflow rates or detention times typical for the secondary clarifier. In view of this, an analysis of secondary clarifier performance was conducted using data collected during various divisions of influent plant flow, i.e., from a 20-80% division to a 50-50% division. Final settling tank daily average detention times varied from approximately 1.3 hours to 6 hours and overflow rates from approximately 300 gpd/ft^2 to 1300 gpd/ft^2.

A total of 295 observations of trickling filter effluent and final settling tank effluent were analyzed and the following equations were obtained by regression analysis techniques:

For BOD removal:

$$\text{Final effluent BOD} = e^{0.84}\,(\text{TF} - \text{BOD})^{0.668}\,Q^{0.521} \qquad (5\text{-}16)$$

For suspended solids removal:

$$\text{Final effluent SS} = e^{0.83}\ (\text{TF-BOD})^{0.668}\ Q^{0.521} \qquad (5\text{-}16)$$

in which TF - BOD refers to filter effluent BOD; TF - SS, to filter effluent suspended solids.

Equation 5-16 had a multiple correlation coefficient of 0.85; Equation 5-17, of 0.84.

Plots of Equation 5-16 and 5-17 are presented in Figures 5-13 and 5-14 respectively.

The similarity of the equations for final effluent BOD and suspended solids implies that a single equation would be satisfactory for both parameters. Such equations are given below, one in terms of tank overflow rate and one in terms of detention time:

$$\text{Final eff. BOD or SS} = 0.092(\text{TF-BOD or SS})^{2/3}\ (Qo)^{1/2} \qquad (5\text{-}18)$$

in which Qo = overflow rate in gpd/ft^2 and

$$\text{Final Eff. BOD or SS} = 3.9(\text{TF-BOD or SS})^{2/3}\ (Dt)^{-1/2} \qquad (5\text{-}19)$$

in which Dt = final settling tank detention time in hours.

Table 5-10 below gives values of final effluent BOD and SS for various values of overflow rate and detention time corresponding to typical values of filter effluent BOD or suspended solids.

TABLE 5-10

CALCULATED VALUES OF FINAL EFFLUENT BOD OR SUSPENDED SOLIDS

Dt Detention Time (hrs.)	Qo Overflow Rate (gpd/ft^2)	Values of F-BOD or Suspended Solids in mg/ℓ							
		50	60	70	80	90	100	110	120
6.0	300	22	24	27	29	32	34	36	39
4.5	400	25	28	31	34	37	39	42	45
3.6	500	28	31	35	38	41	44	47	50
3.0	600	31	34	38	42	45	48	52	55
2.6	700	33	37	41	45	49	52	56	59
2.25	800	35	40	44	48	52	56	60	63
2.0	900	37	42	47	51	55	59	63	67
1.8	1000	40	44	49	54	58	62	67	71
	1100								
1.5	1200	43	49	54	59	64	86	73	77
1.4	1300	45	51	56	61	66	71	76	80
1.3	1400	47	53	58	64	69	74	79	83

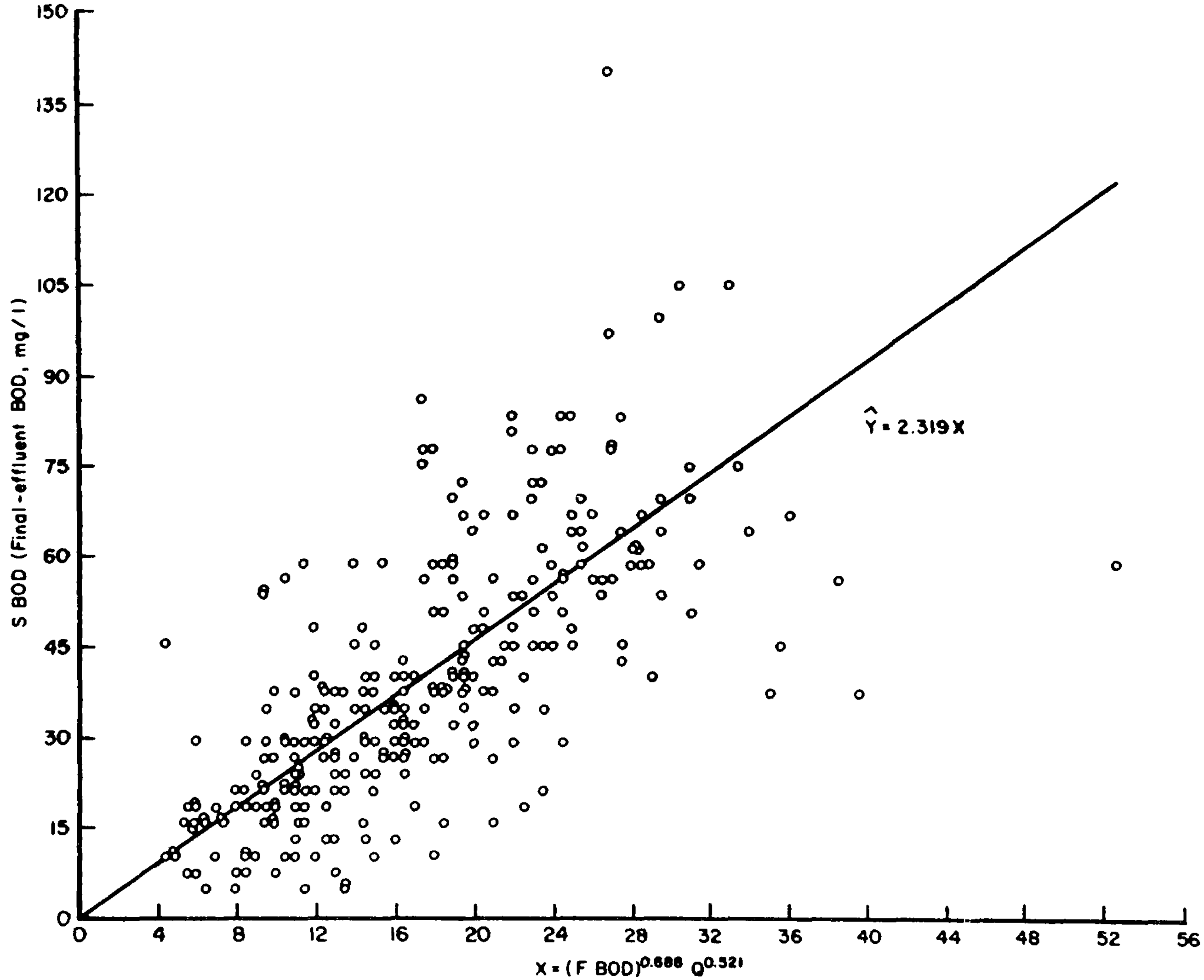


FIGURE 5-13. PLOT OF THE REGRESSION EQUATION FOR BOD IN THE FINAL CLARIFIER

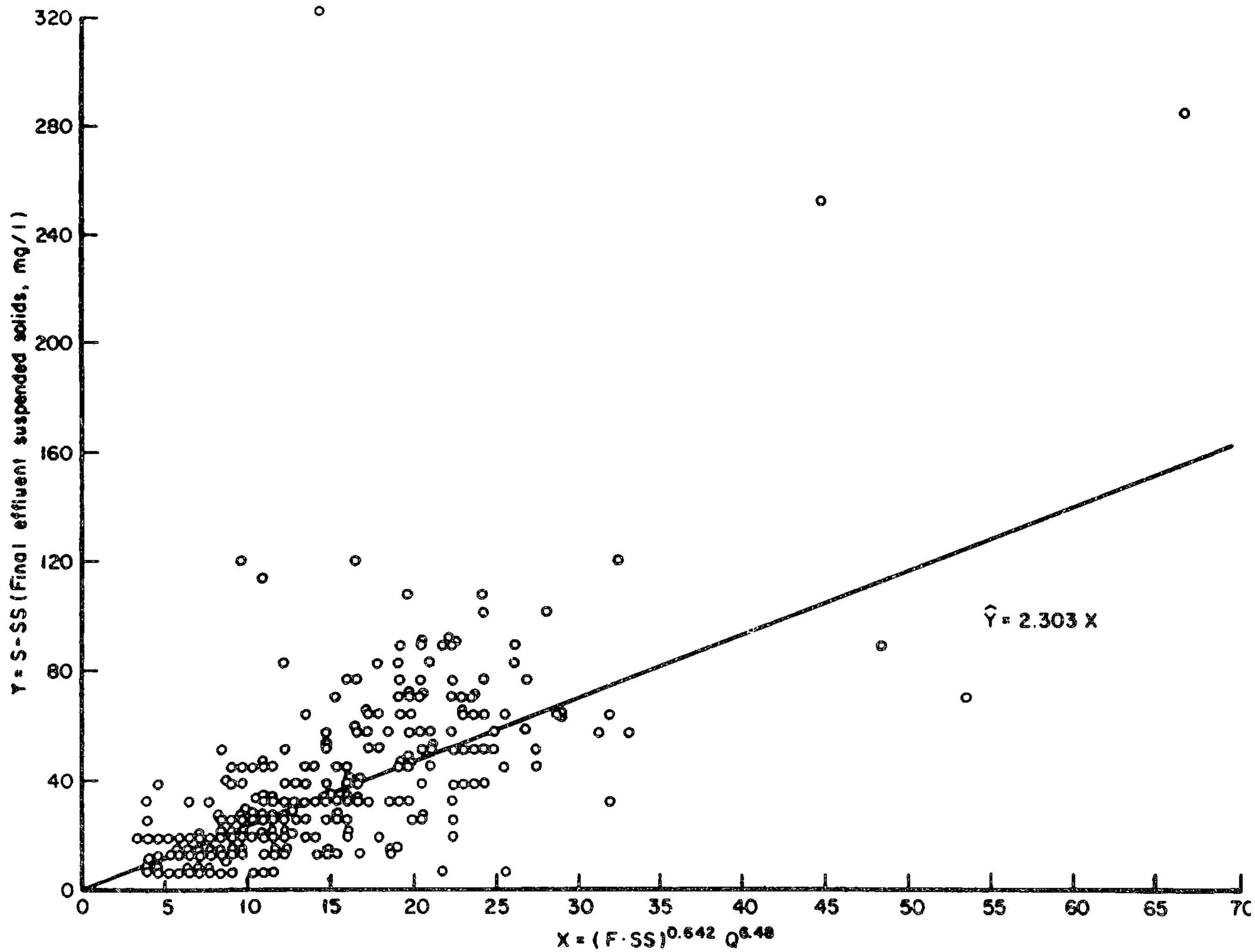


FIGURE 5-14. PLOT OF THE REGRESSION EQUATION FOR SUSPENDED SOLIDS IN THE FINAL CLARIFIER.

Using the results in Table 5-10 and cost information for various sized settling tanks it is possible to make some interesting estimates. For example, if, for a plant of 1 mgd and influent BOD of 200 mg/ℓ, the filter effluent has a BOD of 70 mg/ℓ, the predicted final effluent BOD for a settling tank overflow rate of 1000 gpd/ft^2 would be 49 mg/ℓ. Overall plant removal would be 75.5%. Based on cost information supplied by Black & Veatch (5) the 1971 construction cost of a single final settling tank would be about $42,000. If the surface area of the final settling tank were doubled the overflow rate would be 500 gpd/ft^2 and the predicted final BOD would be 35 mg/ℓ for an overall plant removal of 82.4%. The 1971 construction cost of the larger final settling tank, again based on Black & Veatch, would be about $55,000. The incremental cost of $13,000 is quite reasonable for the projected increase in efficiency. The cost of achieving a similar improvement by adding to other units in a trickling filter plant, i.e., the primary settling tank, the filter, or the recirculation capacity, would be substantially greater.

I. CONCLUSIONS REGARDING OPERATION OF EXISTING TRICKLING FILTER PLANTS

Often there is little that can be done to improve the operation of an existing trickling filter plant unless the plant is not being operated properly. Occasionally, however, plants are designed with sufficient flexibility to allow modifications in operating procedures which can improve treatment results.

Recirculation - Some plants may be provided with ample recirculation capacity, but fail to utilize it. As indicated in Figure 5-10 recirculation ratios up to 3.0 can add significantly to plant performance. High recirculation ratio and consequent high hydraulic loadings also help control the growth of psychoda flies during warm weather. On the other hand, low recirculation ratios may impair operating efficiency and result in conditions favorable to the prolific growth of psychoda flies with attendant nuisance conditions.

At a few plants recirculation flow is drawn from a point downstream of the final settling tanks. This means that both influent base flow and recirculation flow passes through the final tank. In such cases the tank must be designed to handle the higher resulting hydraulic loadings and, consequently, may be quite large. If the point of recirculation suction is changed to a location ahead of the final tank there will be little or no effect on the performance of the trickling filter as a unit, but the performance of the final tank will be significantly improved at the lower hydraulic loading. For example, if the final tank hydraulic loading was 800 gpd/ft^2 with recirculation flow through the tank at a recirculation ratio of 1.0, predicted final effluent BOD and SS according to Table 5-10 would be 48 mg/ℓ if the filter effluent BOD and SS were 80 mg/ℓ. Taking recirculation flow ahead of final tank would reduce the hydraulic loading to 400 gpd/ft^2 and predicted final effluent BOD or SS would be 34 mg/ℓ - a substantial improvement in performance.

Experiments were conducted during this investigation as to the effect of the point of recirculation return, i.e., ahead of the primary settling tank or directly ahead of the filter. Recirculation through the primary tank showed a very slight advantage. If the primary tank is overloaded, e.g., a detention time of one hour or less with recirculation flow passing through the tank, there may be some advantage in direct recirculation. However, the advantage of direct recirculation, under such condition, has not been verified during this study. If prechlorination is not possible, recirculation of filter effluent through the primary tank freshens stale influent sewage and helps prevent odors.

Two-Stage Filtration - If a trickling filter plant has been designed to permit either single- or two-stage operation of the filters, the two-stage method should be used to the greatest extent possible. As has been indicated in this investigation, two-stage operation will result in significant improvement in plant performance as compared with single-stage filtration.

Supernatant Return - The quality of anaerobic digester supernatant and its method of return to the plant flow units can have a significant effect on plant performance. Intermittent, high rate, return of supernatant from a mixed digester will have a very deleterious effect on plant performance and on the appearance of the final effluent. On the other hand, the continuous return of supernatant from an unmixed secondary digester during periods of low plant flow, e.g., during the night, will have little effect on plant performance. For these reasons, when two or more digesters are available, one unit should be used as a secondary to provide conditions for separation of sludge and supernatant. The secondary unit should not be mixed or heated unless the heating system does not contribute to tank turbulence. Supernatant should be returned to the head end of the plant.

J. CONCLUSIONS REGARDING PLANT UPGRADING WITH MINOR ADDITIONS

Recirculation - If no provision for recirculation has been made in the original design, its addition at a later date may be difficult. On the other hand, the addition of a recirculation well with vertical shaft pumps may be possible. As has been shown, recirculation will have a beneficial effect on plant performance.

Frequently the recirculation capacity provided in original design does not permit operation at recirculation ratios much above 1.0. In such cases consideration should be given to increasing recirculation capacity. It is often possible to substantially increase recirculation flow by increasing pump impeller diameter and motor horsepower.

In cases where recirculation is added or increased it will be necessary to carefully check the hydraulic capacity of the various units which will be affected. Particular attention should be given to the capacity of the filter distributor and underdrainage system. Distributor capacity can often be increased by increasing the size of the distribution orifices, provided the distribution arms can carry the extra flow without too high a water level in the central column. The underdrainage system must have sufficient capacity to carry the extra flow without impairing filter ventilation.

Two-Stage Filtration - Often two or more filters exist at a plant but no provision exists for two-stage operation. In such cases, two-stage operation will result in improved performance provided the units have hydraulic capacity to handle the flow. For example, conversion to two-stage operation at Chapel Hill will result in a 33 percent increase in flow through the filters provided the recirculation flow is not increased. In all cases plant hydraulics must be carefully analyzed before attempting any modification to provide two-stage operation. If hydraulic problems are encountered the expedient remedy may be to reduce recirculation flow. When an existing plant is designed for single-stage operation only, it will be necessary to alter some structures, piping and valving to channel the effluent from the first stage units to the second stage units. A flow control system to equalize flow from first to second stage units with plant influent flow must also be provided.

Final Settling Tanks - As indicated in Part H, additional final settling tank capacity will significantly improve overall plant efficiency for relatively minor capital costs.

K. CONCLUSIONS AS TO THE DESIGN OF MAJOR ADDITIONS OR NEW PLANTS

In the selection of a biological treatment process for a new facility a number of cost and operating factors must be considered. If removal of 80 or 85 percent of BOD and suspended solids, during summer months, will meet requirements, the normal single-stage high rate trickling filter process, designed at conventional loadings, is an attractive alternative. Operating costs are relatively low, the system recovers quickly from shock loads and operation is fairly simple. On the other hand, if 90 percent or more removal is required, the activated sludge process is commonly selected. Although this process is more easily upset and requires a higher level of operating skill, it will provide 90 percent or greater efficiency when operating properly.

Smith (27) has reported the total annual cost of various types of treatment plants. Some of these data, adjusted to an ENR Cost Index of 1600, are tabulated below:

TABLE 5-11

COSTS OF TRICKLING FILTRATION AND ACTIVATED SLUDGE PLANTS ADJUSTED TO ENR CONSTRUCTION COST INDEX OF 1600

	Total Annual Cost - ¢/1000 Gallons	
Capacity (mgd)	Trickling Filtration	Activated Sludge
1	22.8	28.9
5	15.2	19.8
10	12.6	16.8
20	10.6	14.0
100	8.5	9.7

Obviously, the trickling filter process has the economic advantage, particularly for small and medium sized plants. If the efficiency of the trickling filtration process could be upgraded to compare with that of activated sludge, it would be a very attractive alternative in many situations.

Frequently, the design engineer faces the problem of obtaining a plant efficiency of 90 percent or more where a trickling filter plant is already in existence. As illustrated in the following example, he might consider the construction of additional plant units, similar to those in existence.

Given: A high rate trickling filter plant with an influent flow of 1 mgd and BOD of 166 mg/ℓ, in which the primary tank removes 35 percent of the BOD and the filters and the final tank removes 69 percent of the remaining BOD for an overall plant removal of 80 percent at a temperature of 22° C. The filter has an area of 0.25 acres and a depth of 4 feet. The recirculation ratio is 2.5. (Filter efficiency is based on Equation 5-12).

Required: An overall plant removal of 90 percent.

Solution: Assume the settling tanks are not overloaded and that required efficiency is to be obtained by providing additional filters.

The required efficiency of the filters and final settling tanks must be 85% for an overall plant efficiency of 90%.

$[E_{oa} = 1 - (1-E_1)(1-E_2);\ 0.90 = 1 - (1-0.35)(1-0.85) = 0.90]$.

Equation 5-12 may be rearranged to solve for filter volume as follows:

$$Le/Lo = 9.84\ (W/V)^{-0.14}\ T^{-0.95}\ (1+Rr)^{-0.28}\ (I_f/V/D)^{0.56}$$

in which W = lbs. settled raw BOD/day
V = filter volume (acre-feet)
I_f = settled sewage influent flow (mgd).

Solving for V

$$V = [(Lo/Le)\ 9.84\ W^{-0.14} T^{-0.95} (1+Rr)^{-0.28} I_f^{0.56} D^{0.56}]^{2.38}.$$

Under the given conditions,

$$V = [(Lo/Le)\ 0.309]^{2.38}$$

and for a filter-final tank efficiency of 85% the required filter volume is 5.59 acre-feet.

The cost of the original filter volume (1.0 acre-feet) estimated from Black & Veatch data (5) adjusted to an EPA Wastewater Treatment Plant Construction Cost Index of 173 is $160,000. For an additional filter volume of 4.59 acre-feet, the added cost will be 4.59 x $160,000 or

$734,000. Attendant recirculation facilities for the new filters will add another say, $250,000, for a total additional initial cost of $984,000. Ammortizing these costs over 25 years at 6% interest plus an additional $20,000 per year for operation gives a total annual cost attributable to the new filters of

$$\$984,000 \times 0.0782 + \$20,000 = \$97,000/\text{year}.$$

If a second filter of the same size of the original filter is added, as a second stage unit and its relative efficiency, compared with the first stage filter, is the same as found in the pilot plant experiments reported previously (i.e., the second stage pilot filter was 93% as efficient as the first stage unit in terms of BOD), the overall plant efficiency would be,

$$E_{oa} = 1 - (1-0.35)(1-0.69)[1-(0.93)(0.69)] = 0.928, \ (92.8\%).$$

In this case the additional cost for one filter is $160,000 plus say, $60,000 for recirculation and $5,000 per year for additional operating costs. The total annual cost over 25 years at 6% interest would be,

$$\$220,000 \times 0.0782 + \$5,000 = \$22,000/\text{year}.$$

Obviously two-stage filtration provides a more economical alternative. The estimated removal for the two-stage system may be optimistic, however, if additional final settling tank capacity were added it seems safe to say that the reliable average BOD removal efficiency would be at least 90 percent.

Chemical treatment of filter effluent at Chapel Hill described in another report (*), indicates that over 90 percent of BOD, SS and phosphorus can be removed with alum dosages of about 175 mg/ℓ. Allowing $55 per ton for alum, $100,000 for the initial cost of chemical storage, handling and feeding equipment, $150,000 for sludge disposal facilities, $100,000 for additional final settling tanks, and $10,000 per year for other additional al operating costs, the total annual cost per mgd is estimated to be $50,000.

The relations developed to predict final settling tank performance (Equations 5-18 and 5-19) clearly indicate the benefits of designing for lower surface loadings. Although these equations are only valid for final tanks following single-stage filtration it is reasonable to suppose that low surface loadings would provide similar improvements following two-stage filtration. When chemical precipitation using aluminum or iron salt for phosphorus removal is required, or likely to be required in the future, low surface loadings will significantly improve overall results. Performance applying liquid alum to final settling tank influent at Chapel Hill was greatly enhanced when final tank sur-

*EPA Report on Phosphorus Removal Studies at Chapel Hill Plant face loadings were reduced to values less than 600 gpd/ft^2. Based on the probability that many plants will be required to remove phosphorus, coupled with the observed improvement in plant performance at low final tank loading with or without chemical treatment, it is recommended that design criteria for new or additional final settling tanks for trickling filter plants be based on a surface loading of 500 gpd/ft^2. Since chemical treatment will be required at many plants it is suggested that structures be provided to facilitate the addition of rapid mixing and flocculation. Flocculation might be provided in a separate structure or as an integral part of the final settling tank.

In summary, new or enlarged trickling filter plants should be provided with the following features:

1. Two-stage operation of filters with provision for interchanging the lead and secondary filters.
2. Sufficient recirculation pumping capacity to provide a recirculation ratio of 3.0 around both first and second stage filters.
3. Final settling tank surface loadings of 500 gpd/ft^2.
4. Provision should be made for the possible future addition of coagulants such as iron and aluminum salts. In this regard, structures designed to facilitate the addition of rapid mixing and flocculation should be incorporated in the design.

Trickling filter plants designed to the general criteria suggested above should provide a very acceptable alternative to activated sludge. Performance will be comparable. Total annual cost will be lower while the traditional advantage of the trickling filter process, i.e., simplicity of operation and ability to withstand shock loads without long term process upset, will be maintained.

The further development of rational theory for trickling filter performance offers distinct possibilities for improvements in process efficiency and economy. In the section of this chapter describing two-stage filtration with pilot filters it was implied that current theory, if substantiated, could lead to the development of deep filters, packed with a media of high specific surface area combined with non-clogging properties, operated at high hydraulic loadings and high recirculation. This type of development might lead to the continuous dosage of wastewater to the surface of the filter with the elimination of costly rotary distributors.

SECTION VI

ACTIVATED SLUDGE STUDIES

The high-rate trickling filter wastewater treatment plant is generally incapable of routinely meeting standards of 90% removal of BOD and suspended solids. The filter effluent contains suspended solids which resist settling and which are removed to only a slight extent in the secondary clarifier. Since nitrification is rarely achieved in high-rate filter plants, the effluent from such a plant is characterized by a high ammonia content (25-35 mg/ℓ NH_4^+-N) which exerts an oxygen demand in the receiving stream.

On the other hand, activated sludge treatment is generally capable of 90% removals of BOD and suspended solids. With appropriate control of dissolved oxygen, loading, and detention time, activated sludge systems can be modified to achieve high degrees of nitrification in relatively short detention times.

Based on such considerations, it would appear that further treatment of trickling filter effluent by short-term activated sludge treatment could enhance the quality of the final effluent.

Hagerich (28), Vosloo and Finsen (29), Hansen *et al.* (30), and the City of San Buenaventura (31) have reported that activated sludge units have been used to treat trickling filter effluent. Hagerich (28) reported overall 96.5% reductions in suspended solids and 96.6% reductions in BOD. He did not report the detention time of the aeration units although the indication is that it was relatively short. Hansen *et al.* (30) report BOD removals of 82% and suspended solids removals of 76%. These removals seemed to be adversely affected by solids carryover and storm water infiltration and wash-out. None of the previous investigations systematically evaluated the most effective design parameters of optimum activated sludge treatment of trickling filter effluent. The purpose of the present investigation was to evaluate the utility, design, operation, and characteristics of activated sludge treatment of trickling filter effluent.

A. 0.1 GPM ACTIVATED SLUDGE PILOT PLANTS

1. Design and Operation

Five tertiary activated sludge pilot plants (ASPP) each consisting of an aeration tank and settling tank with air lift sludge return were constructed as shown in Figure 6-1. Design parameters are given in Table 6-1. The hydraulic detention time varied from 0.4 hr in Unit 1 to 9.2 hr in Unit 5, and the volume under aeration varied from 7 l in Unit 1 to 165 l in Unit 5. The influent to the ASPP was effluent from one of the Chapel Hill trickling filters. This was channeled into a flow splitter and fed at 300 mℓ/min to each unit. The five settling tanks were of identical design; thus, the overflow rates and detention times were identical for each unit. Aeration was provided at such a rate as to maintain the dissolved oxygen in the aerator above 1.5 mg/ℓ. Sludge was returned to the aeration unit at a rate of 1000 mℓ/min, and temperature was controlled at 25° C in the aeration units.

Since the main plant trickling filters were also being manipulated experimentally by altering the organic and hydraulic loading, the quality of the influent to the ASPP varied not only with the traditional season and raw sewage flow but also with the main plant experimental design. The experimental program of the ASPP was designed to evaluate the effect of detention time, sludge wasting, pH control, and influent loading on overall performance (Table 6-2). Sludge was wasted by withdrawing equal portions of the mixed liquor three times a day. During periods of pH control, $NaHCO_3$ was metered into the influent stream in such quantities that influent alkalinity was increased by about 40 mg/ℓ as $CaCO_3$. This program was initiated due to the sharp decrease of pH in units exhibiting nitrification. This will be discussed in a subsequent section. It was anticipated that the small settling tanks would not provide efficient solids removal. To establish the performance of the units with complete solids removal as well as evaluate the contribution of solids to the various quality parameters, all samples were analyzed both uncentrifuged and centrifuged (10 min @ 2200Xg, International Model UV Centrifuge).

Two-day composite samples were collected automatically three times per week by pumping equal volumes from the influent line and the overflow from each settling tank every 30 min into sample containers stored at 3-5° C. They were analyzed for uncentrifuged and centrifuged suspended solids, volatile solids, total organic carbon, chemical oxygen demand (COD), biochemical oxygen demand (BOD), methylene blue active substances (MBAS), and all forms of nitrogen and phosphorus. Mixed liquor grab samples were analyzed for mixed liquor suspended solids (MLSS) and mixed liquor volatile suspended solids (MLVSS). Grab samples of the influent and effluents from the units were analyzed daily for turbidity and pH. Dissolved oxygen, influent flow rate, temperature, return flow rate, and settleable mixed liquor solids were determined daily.

Figure 6-2 is a photograph of the units in operation.

2. BOD Removal

As mentioned earlier, it was anticipated that the small settling tanks would not provide optimum solids removal. Heavy blankets of sludge did develop but channeling problems prevented return of this heavy sludge with the air lift sludge return. While sludge was returned, the concentration was not as great as that which remained in the settling tanks. Thus, large quantities of solids remained in the settling tanks. This accumulation was greatest in the settling tank of Unit 1 and least in Unit 5. During periods of active nitrification in the aeration units

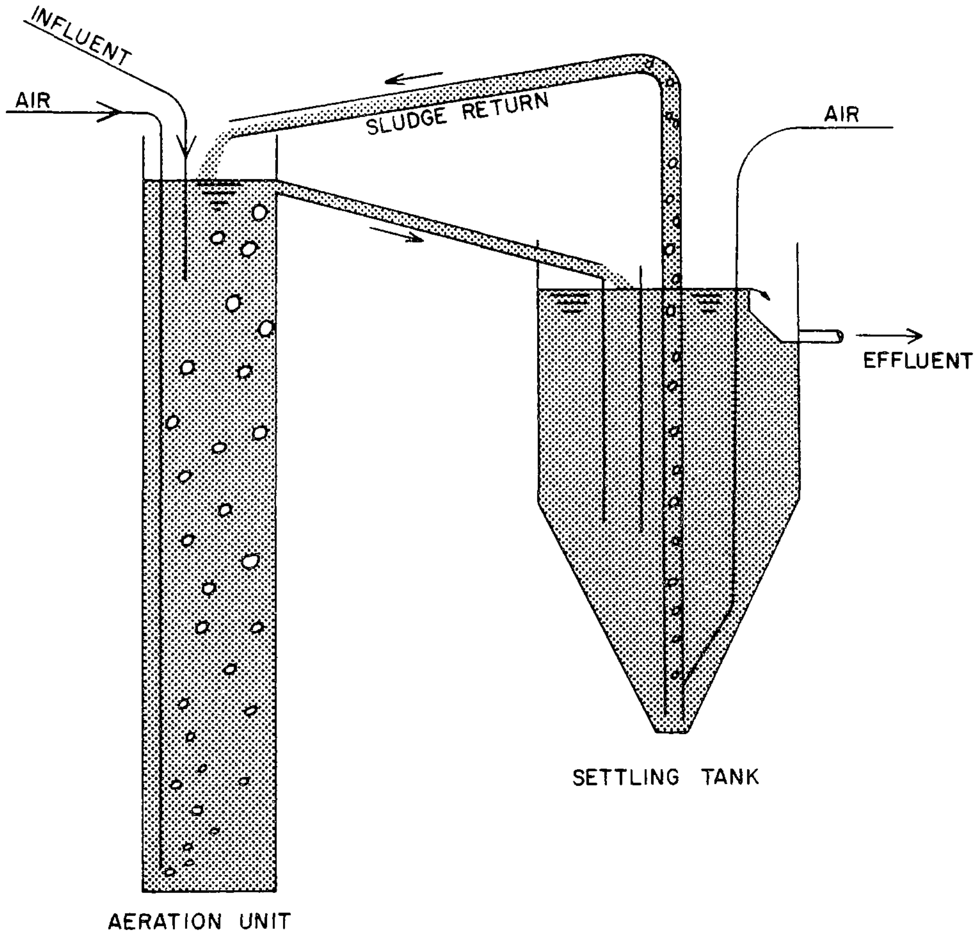


FIGURE 6-1. DIAGRAM OF AERATION UNIT AND SETTLING TANK OF ACTIVATED SLUDGE PILOT PLANT.

TABLE 6-1

DESIGN PARAMETERS

	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5
Influent Flow (mℓ/min)	300	300	300	300	300
Aerator Volume (liters)	7.0	17.1	30.0	73.3	165.0
Detention Time (hours)	0.39	0.95	1.67	4.07	9.17
Return Sludge (mℓ/min)	1000	1000	1000	1000	1000
Temperature °C	25	25	25	25	25

TABLE 6-2

CHARACTERISTICS OF EXPERIMENTAL PERIODS

Exp. Period	Dates	pH Control	Avg. Inf BOD_5*	Sludge Wasting (ℓ/day)				
				Unit 1	Unit 2	Unit 3	Unit 4	Unit 5
I	2/16-3/12/70	No	60	0	0	0	0	0
II	3/13-4/14/70	Yes	60	0	0	0	0	0
III	5/1-6/2/70	Yes	72	0.35	1.1	2.2	2.2	2.2
IV	6/15-7/24/70	Yes	31	1.4	4.4	8.8	8.8	8.8
V	8/3-9/3/70	Yes	20	3	9	18	18	18
VI	9/9-10/25/70	Yes	35	0	0	0	0	0
VII	11/3-12/1/70	No	36	0	0	0	0	0
VIII	12/2/70-1/10/71	No	68	0	0	0	0	0

* mg/ℓ

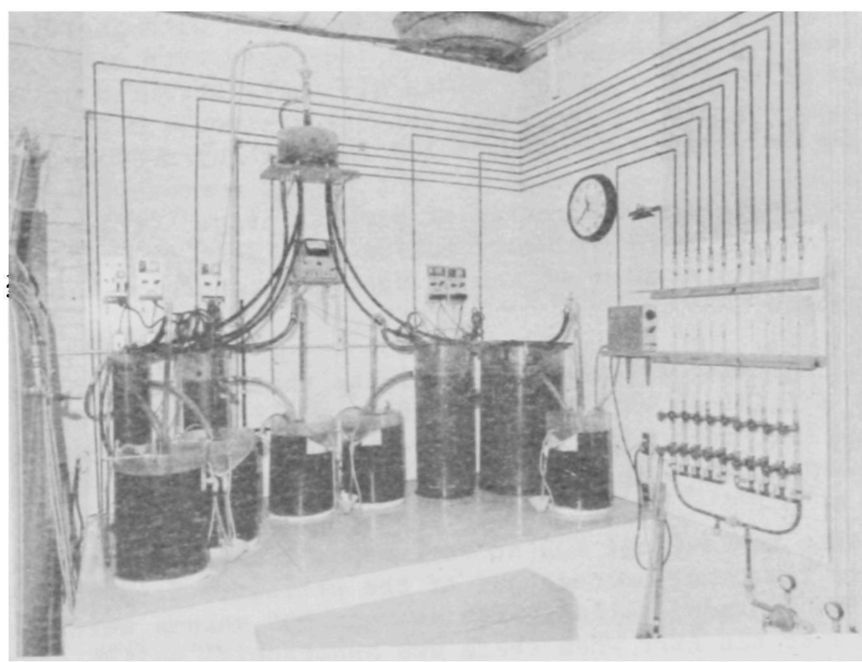


FIGURE 6-2. PHOTOGRAPH OF THE FIVE ACTIVATED SLUDGE PILOT PLANTS.

and active denitrification with consequent release of nitrogen gas in the settling tanks, sludge floated to the surface and was carried into the effluent stream. Thus, the effluent often had a high solids concentration.

Practical activated sludge treatment, of course, requires that the sludge be readily settleable for return to the aeration unit or wasting. Table 6-3 shows the average sludge volume index (SVI) and mixed liquor suspended solids (MLSS) in the five ASPP during the eight experimental periods. Note that, except for period VIII when the system was full of solids due to the long period of no wasting, the SVI was within the acceptable limits of a "good" activated sludge (50-100). This suggests that, with settling tanks more hydrodynamically similar to full scale installation, substantial solids removal by sedimentation might occur.

Mixed liquor suspended solids, in general, decreased with increased detention time, but the total mass of solids increased with detention time due to the size of the units. Since all units were fed at the same rate, loading was highest at the lower detention times. MLSS was generally highest during periods of highest BOD loading and decreased with wasting during periods III, IV, and V. The values increased markedly during period VI following the period of high wasting. During period VIII, high BOD loading and very heavy solids accumulation in the settling tank changed the character of the sludge with resultant bulking and lower than expected MLSS.

The above data regarding SVI and MLSS indicate that an activated sludge process can be maintained with trickling filter effluent as feed. Having established that such a unit will operate, it remains to establish the treatment capability and size of such a unit process.

Table 6-4 presents the average BOD at various points in the full scale trickling filter treatment process and of the effluents from the ASPP. Since the samples included solids, high average BOD values were recorded in the effluents of the ASPP when there was substantial solids carry over. The BOD values of the main plant final settling tank effluent are little different from those of the ASPP influent (trickling filter effluent); therefore, the main plant final settling tank provided little BOD removal. Effluent BOD's from the ASPP generally decreased with increased detention time and were substantially lower than influent in all units for all periods except for Unit 1 in period II. Thus, even with far from optimum sedimentation, sludge return, and sludge wasting, the effluent BOD from these tertiary activated sludge units was substantially lower than normal effluent BOD from the trickling filter plant.

Since it was felt that a full scale activated sludge process would have substantially lower effluent solids, centrifuged as well as uncentrifuged samples were analyzed. Table 6-5 lists the uncentrifuged raw influent BOD, uncentrifuged and centrifuged values of trickling filter effluent BOD, and the centrifuged BOD of the ASPP effluents. Having

TABLE 6-3

AVERAGE SLUDGE VOLUME INDEX (SVI) AND MIXED LIQUOR SUSPENDED SOLIDS (MLSS*) OF ACTIVATED SLUDGE PILOT PLANTS RECEIVING TRICKLING FILTER EFFLUENT

Exp. Period	Unit 1 SVI	Unit 1 MLSS x10^3	Unit 2 SVI	Unit 2 MLSS x10^3	Unit 3 SVI	Unit 3 MLSS x10^3	Unit 4 SVI	Unit 4 MLSS x10^3	Unit 5 SVI	Unit 5 MLSS x10^3
I	80	11.6	118	5.9	45	2.0	38	2.0	33	2.0
II	76	12.6	63	3.2	62	1.8	57	2.0	38	2.2
III	89	10.8	93	2.6	56	1.9	64	2.3	46	1.8
IV	96	4.3	71	1.5	68	1.1	38	0.26	55	0.92
V	89	0.20	32	0.30	32	0.07	32	0.13	20	0.26
VI	65	6.5	61	6.7	66	4.3	64	2.4	61	1.6
VII	60	4.5	70	3.5	45	2.8	43	1.5	21	1.8
VIII	103	8.2	153	4.1	178	1.8	231	1.2	52	0.9

* mg/ℓ

TABLE 6-4

AVERAGE BOD AT VARIOUS POINTS IN TREATMENT PROCESSES INVOLVING A PRIMARY TANK AND TRICKLING FILTER IN SERIES WITH EITHER A FINAL SETTLING TANK (FST) OR ACTIVATED SLUDGE PILOT PLANT (ASPP)

Exp. Period	Raw Influent BOD_5**	FST Effluent BOD_5**	ASPP Inf BOD_5**	ASPP Effluent BOD_5				
				Unit 1	Unit 2	Unit 3	Unit 4	Unit 5
I	176	56	60	41*	29	27	20	22
II	165	53	60	57*	36	25	14	14
III	147	50	72	49*	49*	44	33	8
IV	144	26	31	19	21	12	12	7
V	172	25	20	14	13	10	12	9
VI	133	42	35	20	17	12	8	7
VII	150	54	36	21	12	12	9	7
VIII	132	65	68	18*	41*	29*	31*	8

*Very high solids in effluent
**mg/ℓ

TABLE 6-5

AVERAGE BOD AT VARIOUS POINTS IN A TREATMENT PROCESS INVOLVING A PRIMARY TANK AND TRICKLING FILTER IN SERIES WITH AN ACTIVATED SLUDGE PILOT PLANT AND SUBSEQUENT REMOVAL OF SOLIDS

Exp. Period	Raw Influent BOD_5*	Filter Effluent BOD_5*		ASPP Effluent BOD_5*, Centrifuged				
		Uncentrifuged	Centrifuged	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5
I	176	60	33	8	8	9	4	4
II	165	60	21	7	8	5	3	3
III	147	72	14	10	9	5	3	3
IV	144	31	13	5	3	4	5	3
V	172	20	8	11	6	7	6	5
VI	133	35	17	5	4	4	3	2
VII	150	36	12	5	4	3	2	2
VIII	132	68	34	9	7	5	3	2

*mg/ℓ

already established that the final tank accomplishes very little BOD removal, the uncentrifuged and centrifuged values of filter effluent BOD give an approximation of the effect of complete solids removal on the quality of the final main plant effluent. Complete solids removal by filtration, coagulation, or some other process would indeed improve effluent BOD markedly. However, passing trickling filter effluent through the ASPP and removing solids from the effluent decreased BOD to very low levels. Notice that even with less than 2 hrs. detention (Units 1, 2, and 3) the effluent BOD was within quite acceptable limits. Longer detention time resulted in effluent BOD values which are similar to those of natural fresh water in the Piedmont area of North Carolina. While there was substantial variation in values from unit to unit and period to period with uncentrifuged samples, there was much less variation with centrifuged samples. This, of course, indicates that consistent performance depends in large part on effective solids removal.

Table 6-6 presents the average per cent removal of BOD from trickling filter effluent within the ASPP. Removal generally increased with detention time and generally decreased during the period of high wasting. Since these removals are based on uncentrifuged samples, they are generally lower during periods when the effluent was high in solids. Also, since the values in this table are from uncentrifuged samples, these probably indicate the lowest performance expected by activated sludge treatment of trickling filter effluent. All are, of course, better than the removal provided by the conventional final settling tank in the main plant.

Table 6-7 presents the average removal of BOD within the various ASPP units with subsequent centrifugation of the effluents to remove solids. Removals were much greater with centrifugation, as shown in the previous table. These results, then, represent the highest performance to be expected within the activated sludge units of various detention times treating trickling filter effluent. The variation in performance at various detention times with complete solids removal was much less than without solids removal. This would again indicate that effective solids management would allow substantial BOD removal even at the 0.4 hr. detention time.

One of the implicit purposes of any addition to the treatment flow sheet of the trickling filter process is to increase overall BOD removals to greater than 90%. Figure 6-3 shows the BOD removal by the main plant during the eight experimental periods and the additional removal by activated sludge treatment of trickling filter effluent. These values are calculated on the basis of uncentrifuged samples. With this lowest performance measurement, there is generally substantial improvement even with the short detention time units while the higher detention units generally provided approximately 90% overall BOD removal.

Figure 6-4 shows the overall BOD removal in the main plant and the additional removal by the activated sludge units followed by solids removal.

TABLE 6-6

AVERAGE PER CENT BOD REMOVAL IN ACTIVATED SLUDGE PILOT UNITS
BASED ON UNCENTRIFUGED SAMPLES

Exp. Period	Avg. Inf. BOD, mg/ℓ	% BOD Removal*				
		Unit 1	Unit 2	Unit 3	Unit 4	Unit 5
I	60	32**	52	55	67	63
II	60	5**	40	59	77	77
III	72	32**	32**	39	54	89
IV	31	39	33	62	62	78
V	20	26	32	47	42	55
VI	35	48	53	67	77	79
VII	36	43	67	67	74	80
VIII	68	76**	40**	57**	54**	88

$$*\% \text{ BOD Removal} = \left[1 - \left(\frac{\text{Effluent BOD, Uncentrifuged}}{\text{Influent BOD, Uncentrifuged}}\right)\right] \times 100$$

**Very high solids in effluent

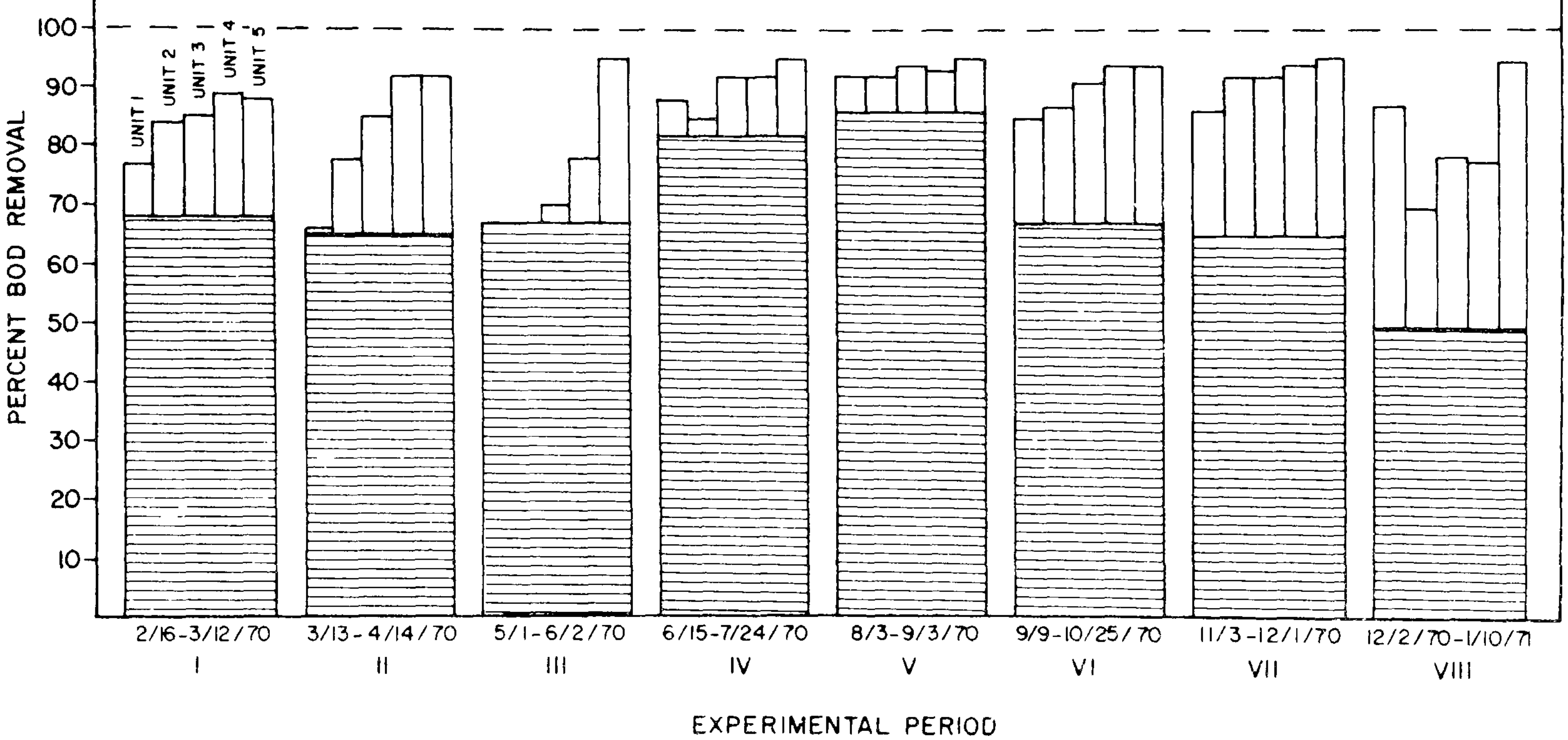
TABLE 6-7

AVERAGE PER CENT BOD REMOVAL BY ACTIVATED SLUDGE PILOT PLANTS WITH SUBSEQUENT SOLIDS REMOVAL

Exp. Period	Avg. Inf. BOD, mg/ℓ	% BOD Removal*				
		Unit 1	Unit 2	Unit 3	Unit 4	Unit 5
I	60	87	87	85	93	93
II	60	88	87	92	95	95
III	72	86	87	93	95	95
IV	31	84	90	87	84	90
V	20	46	69	63	68	72
VI	35	86	90	87	92	95
VII	36	85	99	91	95	95
VIII	68	87	89	93	96	97

$$\text{*\% BOD Removal} = [1 - (\frac{\text{Effluent BOD, Centrifuged}}{\text{Influent BOD, Uncentrifuged}})] \times 100$$

Figure 6-3. - Percent Removal of BOD in the Main Plant (shaded) and Additional Removal in the Activated Sludge Pilot Plants (open)



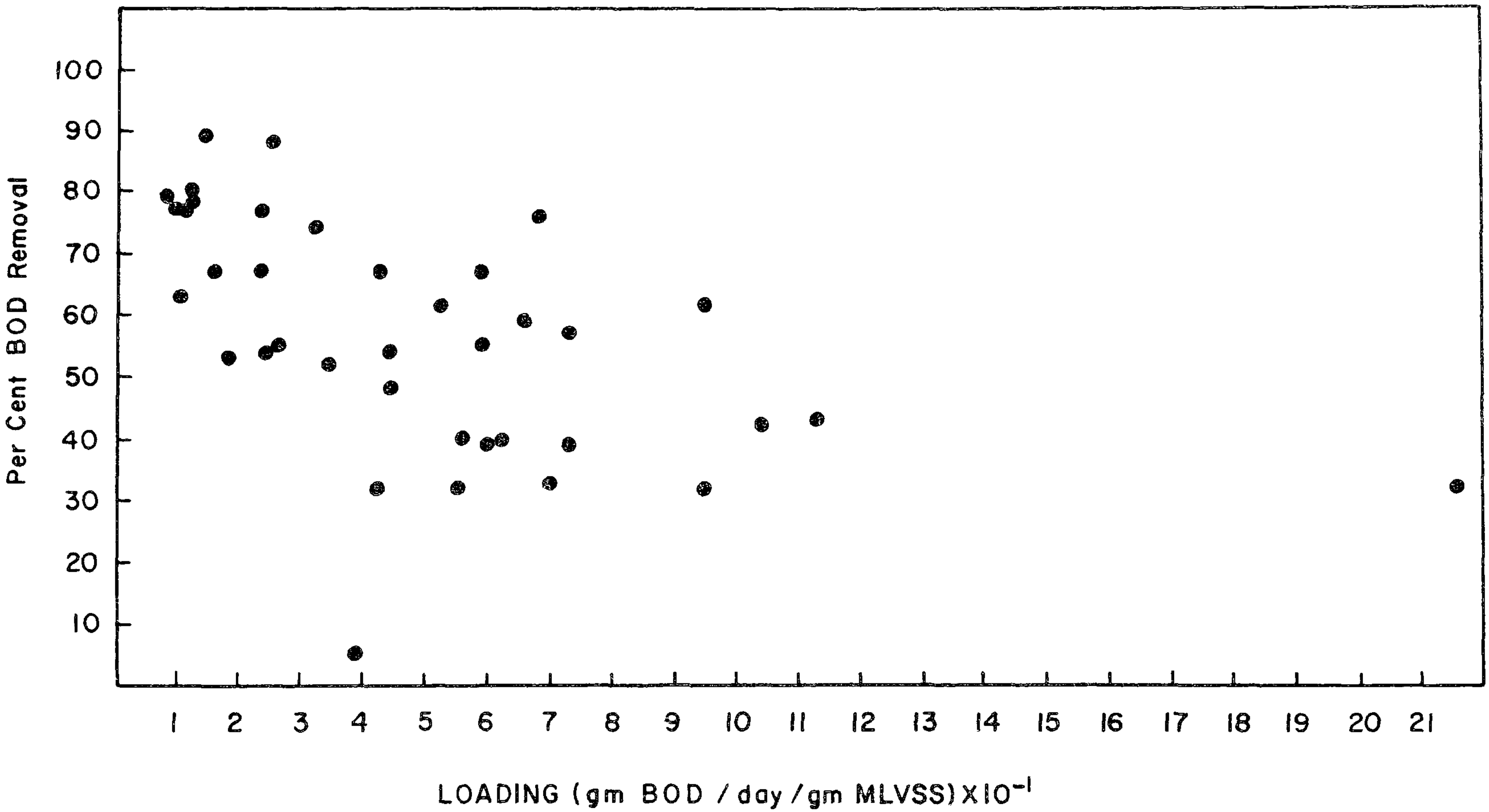


FIGURE 6-5 RELATIONSHIP OF BOD LOADING TO PER CENT BOD REMOVAL IN ACTIVATED SLUDGE PILOT PLANTS.

All BOD removals are in excess of 93%. Thus, with optimum solids management even 0.4 hr. detention consistently may result in greater than 90% removal.

It has already been shown that the final settling tank in the present trickling filter plant improves overall removals by only 1-10%. Since this tank allows approximately 2 hrs. detention, it may be possible to economically convert it to contain an aeration and settling chamber as previously reported by Hansen *et al.* (30). Thus, performance could be substantially improved at low capital cost.

Figure 6-5 shows the relationship of BOD removal to BOD loading in the ASPP. These results are based on uncentrifuged samples, but the same type of relationship holds for centrifuged samples. As expected, BOD removal increased as loading decreased. This suggests improved trickling filter performance with greater BOD removal would allow better further removal in activated sludge units treating trickling filter effluent.

Removals of COD and organic were very similar to removal of BOD in the ASPP. MBAS reduction in the ASPP averaged 50-75% from trickling filter effluent with final effluent values of 0.2-0.8 mg/ℓ. Phosphorus removal was nil through the ASPP, but the addition of activated sludge treatment to trickling filter plants may provide a convenient point for addition of chemicals for precipitation of phosphorus.

The results of this investigation established that activated sludge treatment of trickling filter effluent substantially increased overall BOD, COD, organic carbon, and MBAS removals. Furthermore, very short detention times were sufficient for substantial improvement. The amount of the increase was dependent upon the ability to remove solids from the effluent and carefully control returned sludge and wasting rates. It is realized that the magnitude of some of the results reported here may be due to the 25° temperature of the aeration units. Since the main interest of this investigation was to evaluate the effect of detention time and since the variation in size of the units would cause large variations in temperature, it was necessary to hold temperature constant. Experience with samples from short periods when the temperature controllers were out of order indicates that the temperature effect is not as great as one would might suppose.

3. Nitrification

Most of the nitrogen in the effluent of a typical high-rate trickling filter plant is in the form of ammonia. Ammonia released into receiving waters exerts an oxygen demand and serves as an algal nutrient. Incorporation of nitrification processes into waste treatment would insure oxidation of ammonia to nitrate, thus reducing oxygen demand of the effluent. In addition, oxidized nitrogen in nitrified effluents is amenable to removal by denitrification (32).

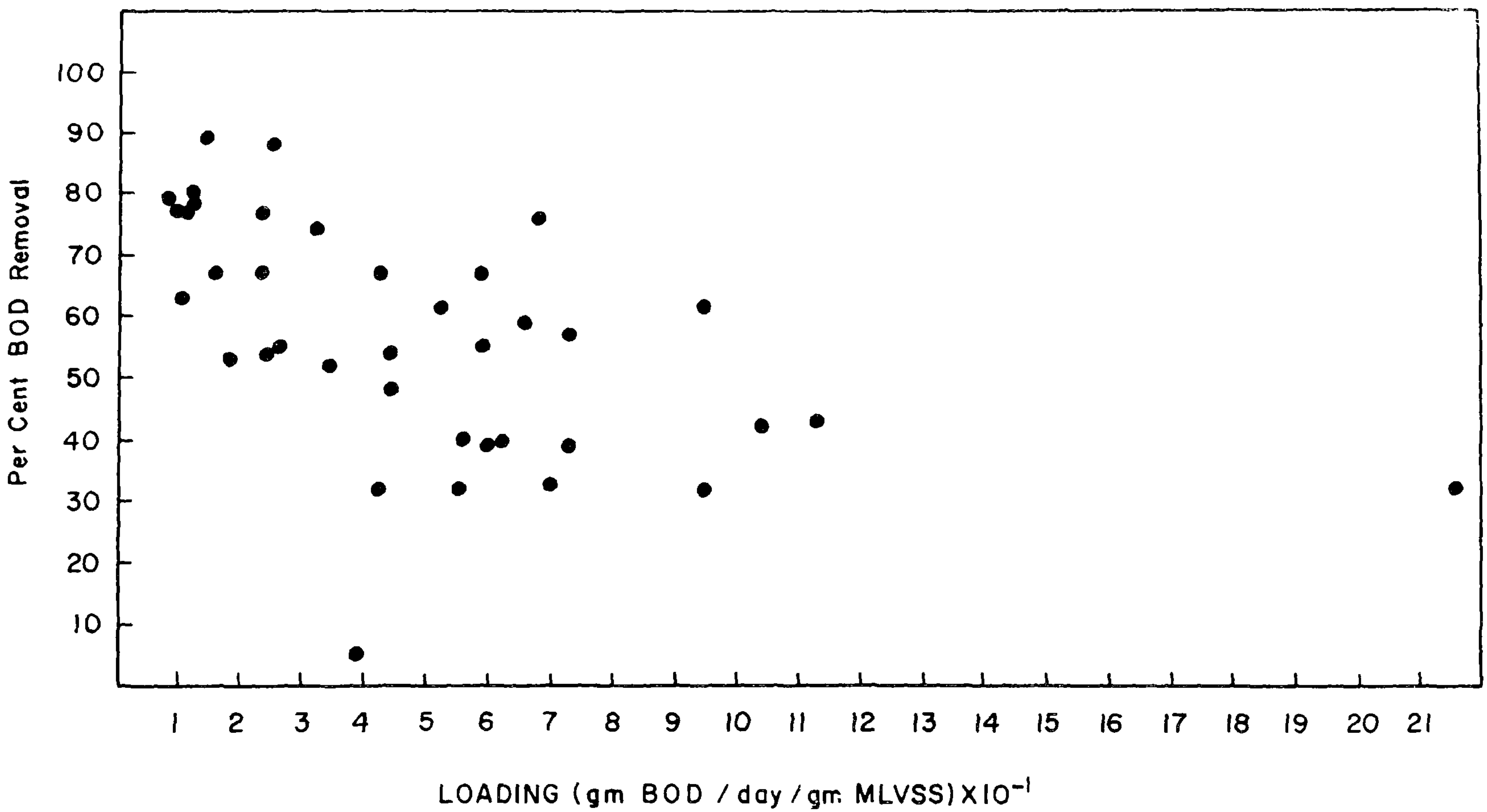


FIGURE 6-5 RELATIONSHIP OF BOD LOADING TO PER CENT BOD REMOVAL IN ACTIVATED SLUDGE PILOT PLANTS.

Nitrification is a biological process. The most important genera of bacteria involved in nitrification are *Nitrosomonas,* which oxidizes ammonia to nitrite, and *Nitrobacter,* which oxidizes nitrite to nitrate (see reviews by Painter, 32; Alexander, 33; and Thimann, 34). These organisms are obligate autotrophs, requiring inorganic carbon in the form of carbon dioxide or bicarbonate. During nitrification, acidic products are formed from oxidation of ammonia and alkalinity is decreased due to consumption of inorganic carbon; thus, in poorly buffered systems the pH decreases. The nitrifying organisms are obligate aerobes, requiring an oxygen concentration of at least 0.5-0.6 mg/ℓ (35, 36), with the possible exception of some marine species reported to operate at much lower oxygen concentrations (37). While oxygen concentrations of 1-7 mg/ℓ are generally recommended for nitrification (35) it has been observed that nitrifying activated sludge can become acclimated to semiaerobic conditions (38).

Intimately related to the effect of oxygen concentration is the effect of loading. Wuhrmann (39) noted in his investigations that considerable nitrification took place at low (1 mg/ℓ) oxygen concentrations provided that a low plant load was combined with high sludge concentrations; on the other hand, no nitrification took place even at 7 mg/ℓ with high loading rates. Other investigators (40, 41) have also noted significant decrease in nitrification with increased loading.

There are a number of ways in which high loading may affect nitrification. High loading may result in higher concentrations of inhibitory compounds in the nitrification unit. Many organic compounds inhibit nitrification, among them gelatin, some amines, alkaloids, and amino acids (34). Higher loading could conceivably increase ammonia concentration in the aerator to a level intolerable to nitrifiers. Both *Nitrosomonas* and *Nitrobacter* are inhibited by high levels of ammonia; the latter, more sensitive, does not develop in many cases until the ammonia level has been reduced by *Nitrosomonas* (34). High loading also increases the concentration of carbonaceous materials which are readily assimilable by heterotrophic bacteria. It is the opinion of several investigators that the inhibitory effect of most organic materials on nitrification is due to their stimulation of rapid-growing heterotrophs which assimilate the majority of the inorganic nitrogen, making it unavailable to the slower growing nitrifiers (33, 42). In addition, if high loading necessitates sludge wasting from an activated sludge unit, the removal of the slow-growing nitrifiers can prevent development of a population large enough to accomplish nitrification.

Since the nitrifying bacteria are obligately autotrophic, inorganic carbon is an essential nutrient for their growth. Thus, nitrifiers may be limited by availability of inorganic carbon in the same manner as are algae (43, 44, 45). Little information is available on the effect of inorganic carbon concentration on the efficiency of nitrification processes. In addition, it is difficult to distinguish the relative importance of inorganic carbon availability because of the common practice, both in basic and applied investigations, of adding bicarbonate or carbonate alkalinity to the feed to control pH (29, 34, 42, 46, 47).

The optimum pH for nitrification is currently a controversial topic. It has been variously reported from pH 6.0 (47) to pH 8.8 (34). Meek and Lipmann (48) reported the isolation of organisms capable of nitrification at pH 4.1. Wild, Sawyer, and McMahon (49) report that the optimum pH for nitrification by activated sludge is 8.4 with 50% of the maximum rate occurring at pH's of 7.0 and 9.8. Rimer and Woodward (50), on the other hand, were unable to maintain nitrification in their activated sludge system at pH lower than 8.3-8.5. Recent reviews of the effect of pH on nitrification in soil (33, 51) described instances in which nitrification occurred at pH's as low as 4.0-4.5; both reviews indicate the possibility that there are little known species of nitrifiers adapted to low pH. Alexander (33) cites studies indicating that some isolates from alkaline soils have an optimum of 7.8.

Changes in pH may affect nitrification in several ways. pH may affect essential biochemical reactions, or alter the toxicity of metals or cyanide (36, 46). A low pH is also an indication that the alkalinity has been depleted.

The optimum temperature for nitrification is 30-35 C (34) although nitrification can occur over the range 5-40 C (33).

While a number of investigations have been performed on nitrification processes in wastewater, few studies have been performed on the application of the activated sludge process for upgrading trickling filter effluent. Two previous studies in this category are those of Wild, Sawyer, and McMahon (49) and Vosloo and Finsen (29).

Vosloo and Finsen (29) investigated application of the activated sludge process to improvement of a low-rate filter effluent in both batch and continuous studies over a one-month period. In a continuous feed unit operated with 17-30 mg/ℓ influent NH_3-N, a 2.9 hr aeration period, and a MLSS concentration of 8000 mg/ℓ, an average of 85% of the ammonia was removed. Further studies performed with an excess of alkalinity in the form of powdered calcium carbonate showed that oxidation of 1 gm/ℓ of nitrogen caused a decrease in alkalinity of 7.15 mg/ℓ. Vosloo and Finsen found that appropriate batch addition of powdered calcium carbonate maintained the pH above 6, allowed nitrification to proceed to completion, and greatly improved settleability of the sludge.

Wild, Sawyer, and McMahon (49) investigated nitrification in a pilot activated sludge unit receiving settled high-rate trickling filter effluent and in laboratory batch studies. Effect of pH, MLVSS concentration, ammonia concentration, and BOD on nitrification were studied in batch studies. pH was controlled by addition of sodium hydroxide. From short-term (3 hr) experiments, the following conclusions were drawn:

1. ammonia concentration does not inhibit nitrification at concentrations less than 60 mg/ℓ
2. pH sharply affects rate of nitrification; optimum pH is 8.4

3. increases in temperature increase rate of nitrification, in the range of 5-30 C
4. for a given sludge, with MLVSS concentrations in the range 800-6000 mg/ℓ, the time to completely nitrify a given amount of ammonia per gram of MLVSS is constant under the same environmental conditions
5. instantaneous increases in BOD concentration over the range 5-110 mg/ℓ do not affect rate of of nitrification.

During pilot-plant activated sludge studies at Chapel Hill nitrification was consistently noted in several of the units, leading to further investigations on the factors affecting nitrification.

In the following discussion of results from these studies, performance of the units under the various modes of operation is presented in terms of ammonia removal, though it must be understood that the ammonia nitrogen is not removed but rather converted to oxidized forms -- nitrite and nitrate -- during nitrification. The observation that some denitrification was occurring in the final settling tanks made it desirable to express the results in terms of ammonia disappearance rather than in terms of nitrate increase.

As shown in Figure 6-6, some ammonia removal occurred during all phases of operation. In general, units with the longer detention times removed a higher percentage of the ammonia. Of a total of 40 cases (5 units, 8 operational phases) there were 10 cases in which 90% or more of the ammonia was removed and 6 cases in which 45% or less was removed. A summary of the average values of several operating parameters, contrasting these values in cases of high and low removal, is presented in Table 6-8. From Table 6-8, it is apparent that maximum removals are usually, but not exclusively, correlated with low influent BOD, long detention time, low loading, low MLSS, and adequate bicarbonate alkalinity. A cursory examination of pH would seem to indicate that low pH is also associated with maximum removal, but the lower pH levels are probably simply an effect of extensive nitrification.

In order to simplify interpretation of the results obtained under different operating conditions, the amount of ammonia removed as a function of detention time is presented in Figures 6-7 - 6-10.

Figure 6-7 shows ammonia removal under conditions of no sludge wasting and no alkalinity addition. Note that while the influent ammonia concentrations are similar, average influent BOD varied from 35-68 mg/ℓ. In general, ammonia removal was greatest during the phase when influent BOD was lowest; poorer, during the phases when influent BOD was 60-68.

The effect of alkalinity addition (bicarbonate) on ammonia removal is shown in Figures 6-8 and 6-9. Under these conditions of no sludge wasting and low (35-36) BOD in the influent (Figure 6-8) alkalinity addition had little effect at the shorter detention times, but at longer detent-

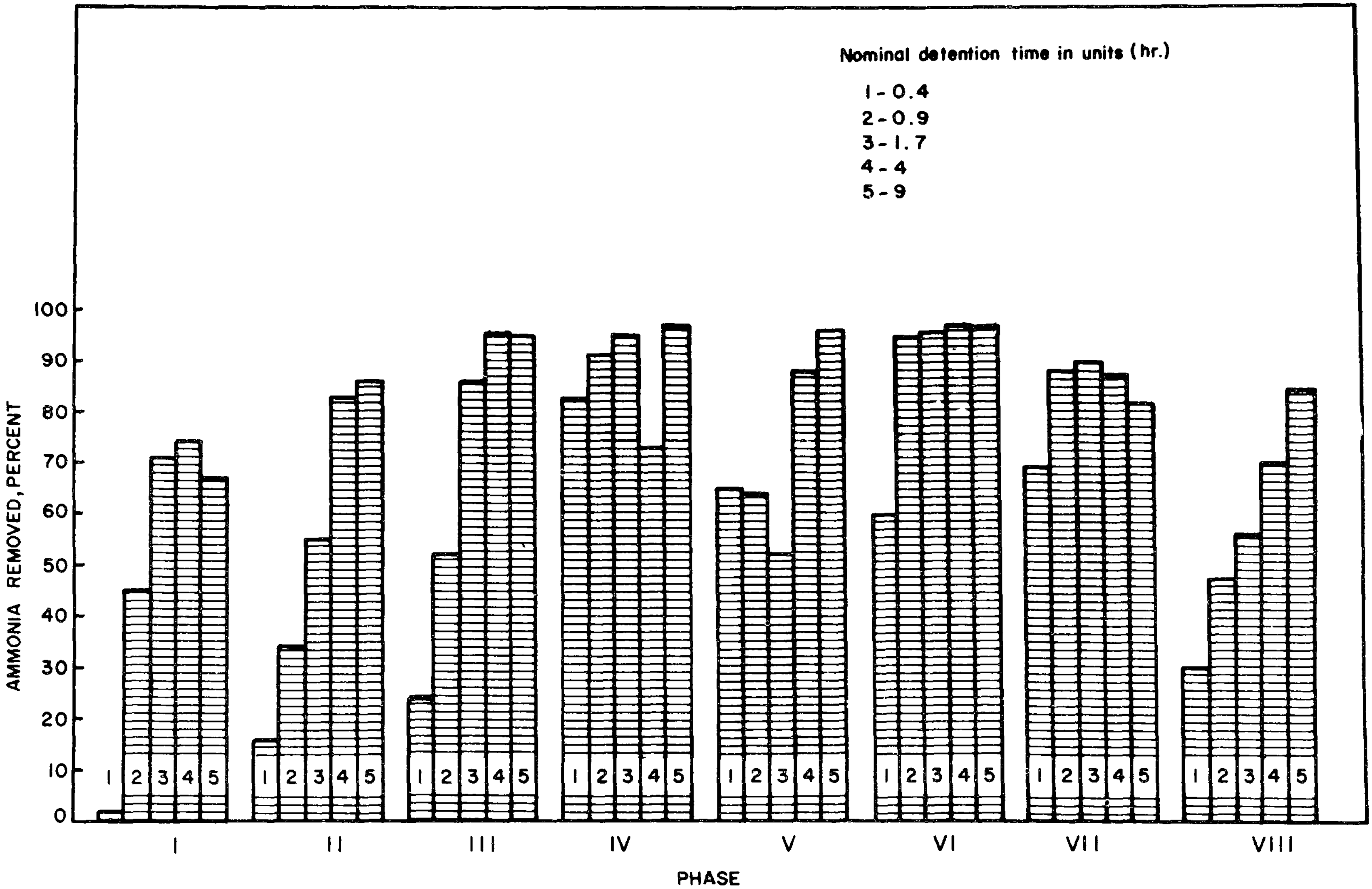


FIGURE 6-6 -- AMMONIA REMOVAL IN ACTIVATED SLUDGE PILOT PLANTS DURING 8 PHASES OF OPERATION.

TABLE 6-8

PARAMETERS DURING PERIODS OF MAXIMUM AND MINIMUM AMMONIA REMOVAL

Parameter	Maximum Removal (90% or more) Range*	Avg.**	Minimum Removal (45% or less) Range*	Avg.**
pH	6.3-7.3	6.8	7.0-7.5	7.2
Influent BOD (mg/ℓ)	20-72	40	60-72	63
Influent NH_3-N (mg/ℓ)	13.0-24.0	19.8	19.4-26.8	22.5
Hydraulic Detention Time (hr)	0.95-9.5	4.5	0.39-1.05	0.61
Loading $\frac{\text{lb BOD/day}}{\text{lb MLSS under aeration}}$	0.06-0.52	0.19	0.26-0.51	0.38
MLSS Concentration (mg/ℓ)	260-6670	2155	3240-12630	8060
Dissolved Oxygen (mg/ℓ)	4.2-7.1	6.0	3.3-5.8	4.9
Bicarbonate addition	10 of 10 cases		3 of 6 cases	

*Range of mean values obtained for units during operational phases. Daily values varied over a wider range.

**Average of mean values obtained for units during operational phases.

TABLE 6-9

EFFECT OF BICARBONATE ADDITION ON AVERAGE pH AND INORGANIC CARBON CONCENTRATIONS IN ACTIVATED SLUDGE UNITS RECEIVING INFLUENT WITH LOW BOD (35-36 mg/ℓ)

	NO BICARBONATE Phase 7		BICARBONATE Phase 6	
UNIT	pH	Inorg. C (mg/ℓ)	pH	Inorg. C (mg/ℓ)
1	5.7	10.5	7.3	27.4
2	5.7	1.0	6.7	8.2
3	5.6	0.2*	6.8	11.1
4	5.4	0.3*	6.7	7.3
5	5.1	0*	6.7	3.5*

*Inorg. C concentration 0 at times.

TABLE 6-10

EFFECT OF BICARBONATE ADDITION ON AVERAGE pH AND INORGANIC CARBON CONCENTRATIONS IN ACTIVATED SLUDGE UNITS RECEIVING INFLUENT WITH HIGH BOD (60-68 mg/ℓ)

	NO BICARBONATE				BICARBONATE	
	(Phase 1)		(Phase 8)		(Phase 2)	
UNIT	pH	Inorg. C (mg/ℓ)	pH	Inorg. C (mg/ℓ)	pH	Inorg. C. (mg/ℓ)
1	7.3	24.1	7.2	23.5	7.4	29.7
2	7.0	15.1	7.0	19.3	7.3	25.0
3	6.5	6.4	6.9	13.5*	7.1	16.5
4	5.3	4.3	6.6	8.7*	6.8	10.4
5	4.7	3.5	6.1	0.6*	6.1	4.2

*Inorganic C concentration 0 at times.

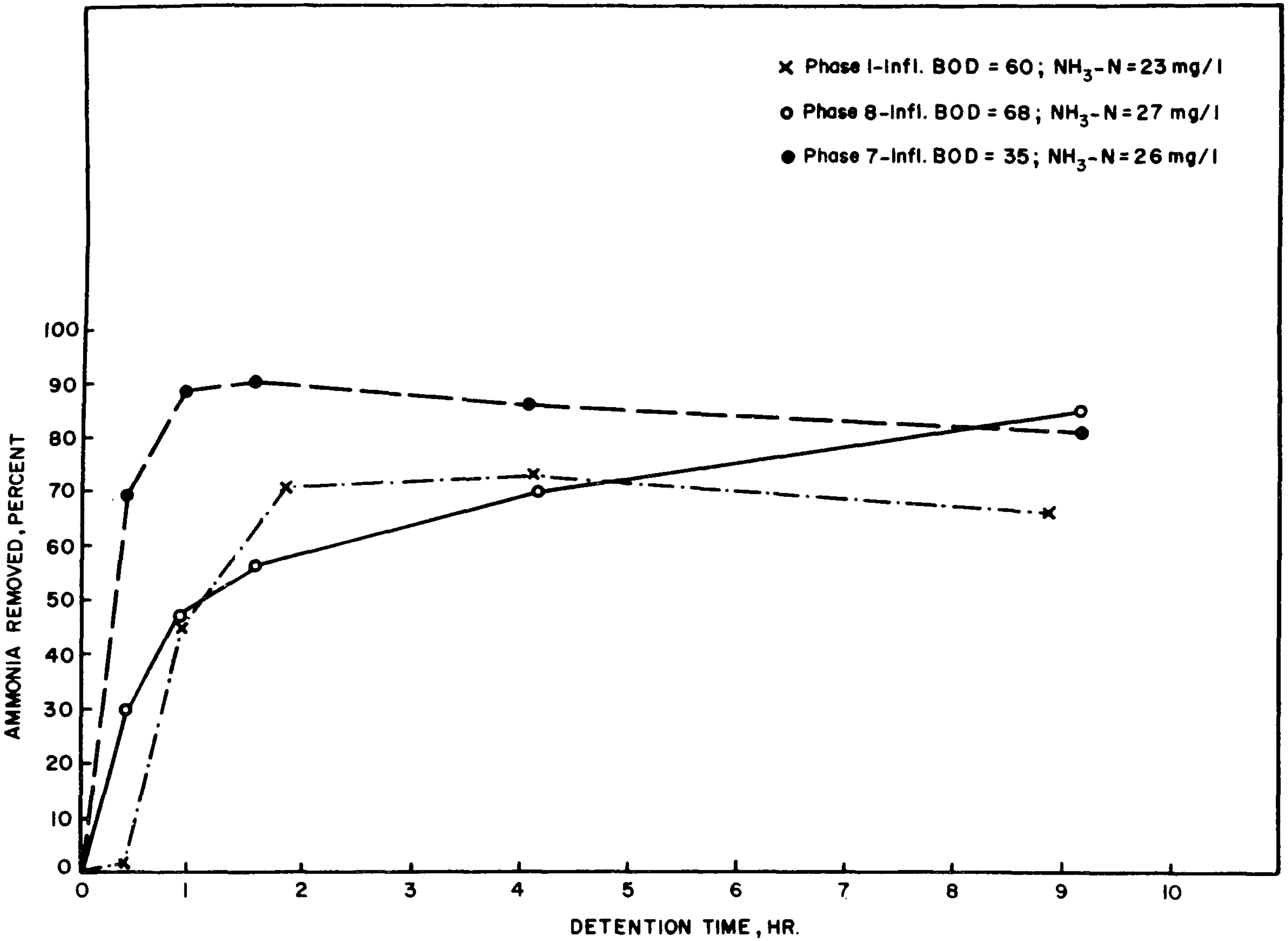


FIGURE 6-7 -- AMMONIA REMOVAL UNDER CONDITIONS OF NO SLUDGE WASTING AND NO BICARBONATE ADDITION

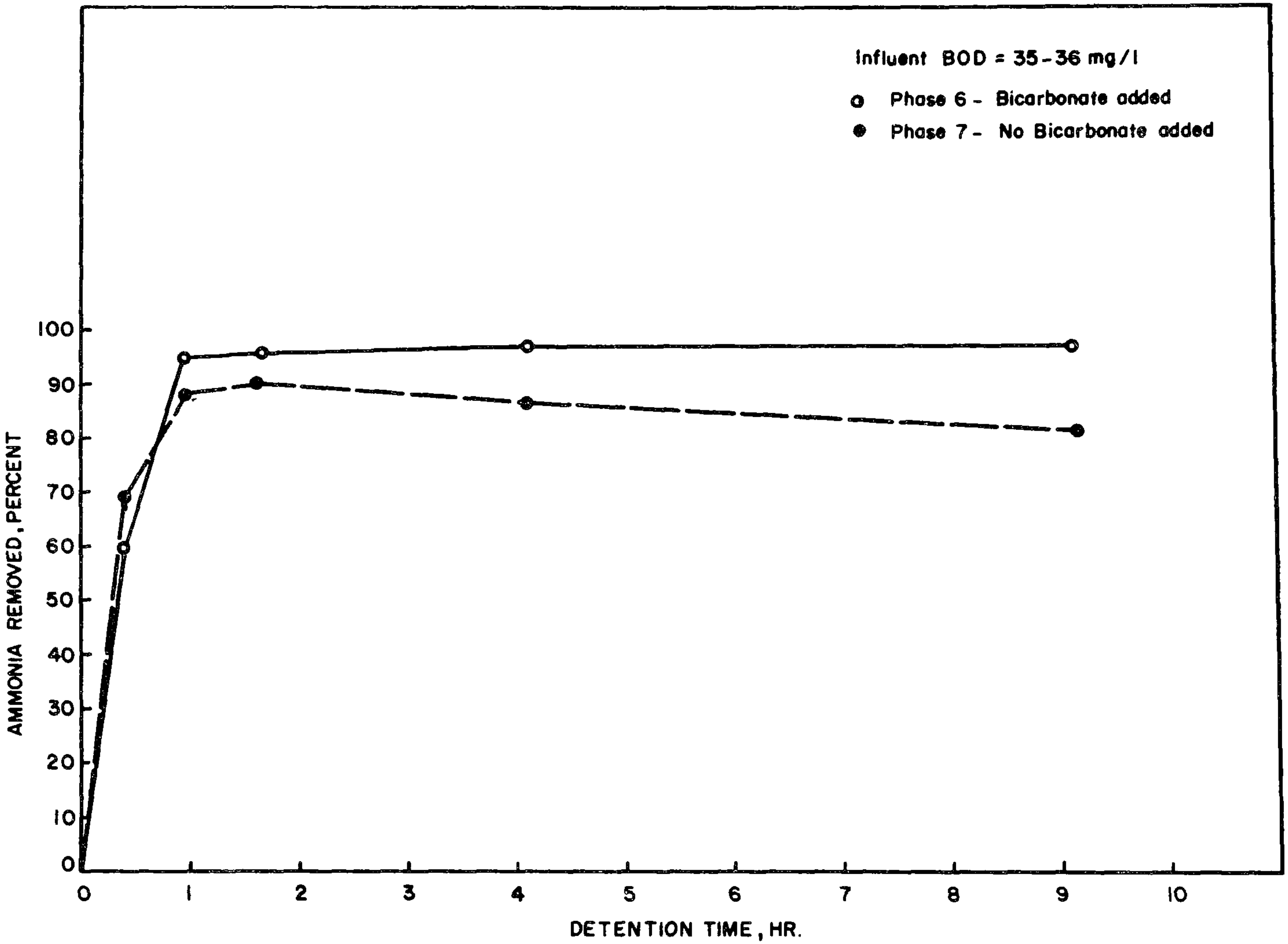


FIGURE 6-8 -- AMMONIA REMOVAL UNDER CONDITIONS OF NO SLUDGE WASTING AND LOW INFLUENT BOD: EFFECT OF BICARBONATE ADDITION

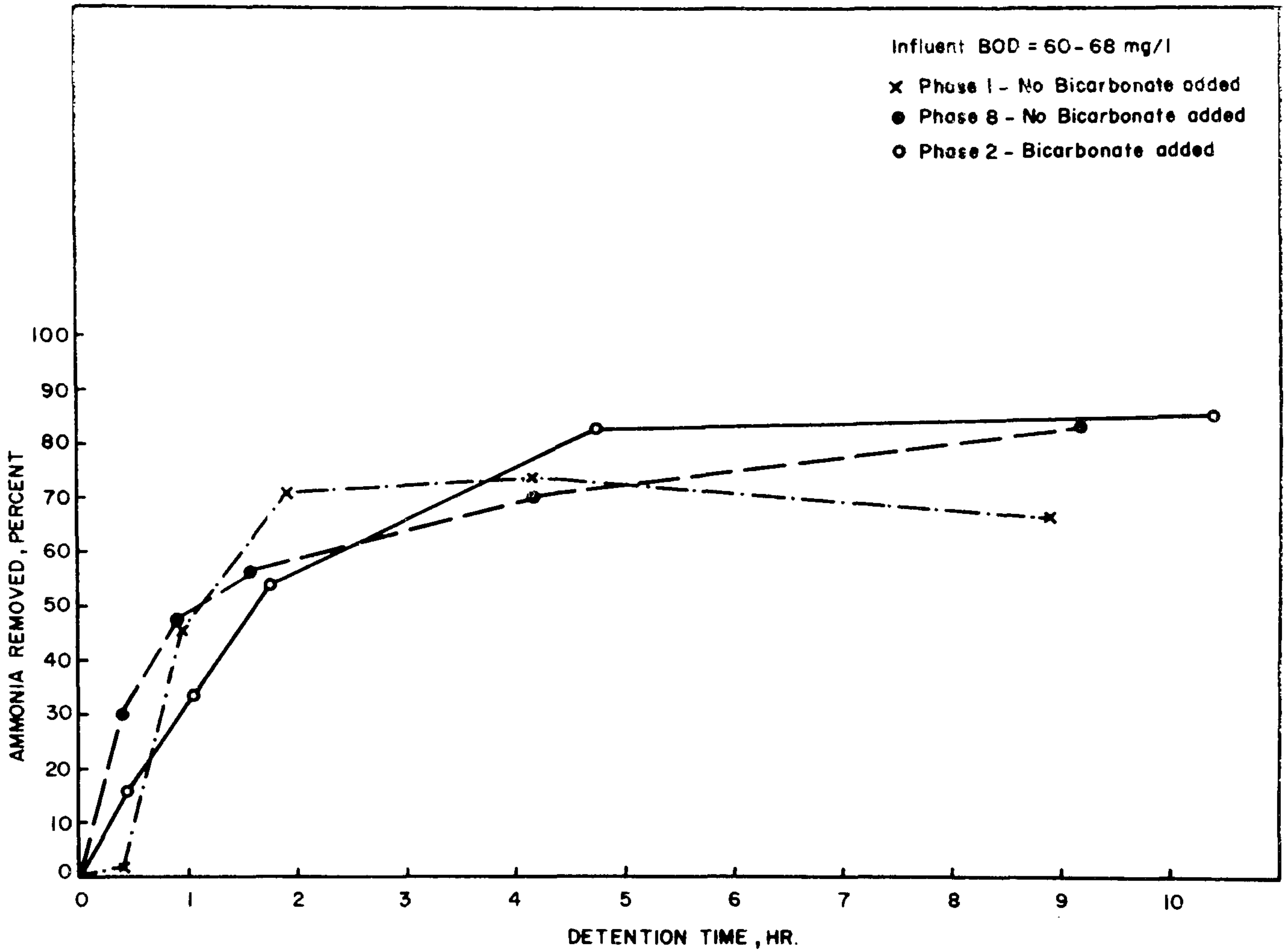


FIGURE 6-9 -- AMMONIA REMOVAL UNDER CONDITIONS OF NO SLUDGE WASTING AND HIGH INFLUENT BOD: EFFECT OF BICARBONATE ADDITION.

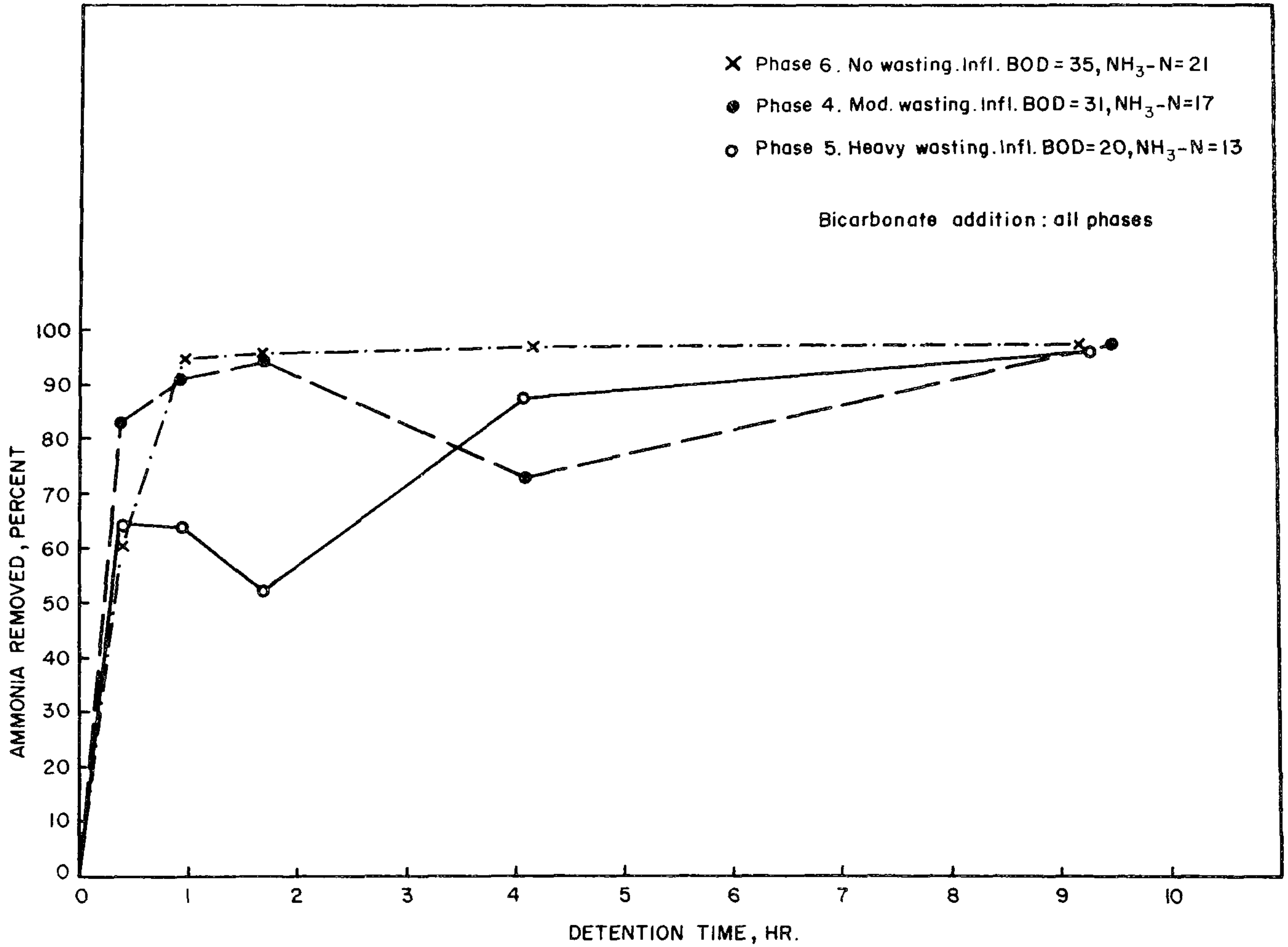


FIGURE 6-10. AMMONIA REMOVAL DURING VARIOUS PATTERNS OF SLUDGE WASTING.

ion times, the extent of ammonia removal was less when alkalinity was not added. Since bicarbonate addition serves both to provide inorganic carbon and to control pH, distinguishing between pH and inorganic carbon concentration effects is not possible under the conditions of these experiments. During phase 7, without alkalinity addition, inorganic carbon concentration in the units was low, as shown in Table 6-9.

Under conditions of high influent BOD (Figure 6-7) effect of alkalinity addition was not as clear. However, the depression of ammonia removal under conditions of long detention time and no alkalinity addition was noted in one case. A comparison of pH and inorganic carbon concentrations is shown in Table 6-10. The drastic drop in pH to 4.7 in Unit 5, phase 1, may account for the poor performance as compared to the same unit during phase 8 (Figure 6-9). The pH in the unit remained above pH 6 during phase 8, despite low inorganic carbon concentrations; the reason for this phenomenon is not known.

The effect of sludge wasting on the units is shown in Figure 6-10. On the whole, moderate sludge wasting did not affect nitrification performance, but high rates of wasting hindered nitrification at the intermediate detention times.

The relationship of ammonia removal to mixed liquor suspended solids concentration is presented in Figures 6-11 -- 6-15.

Variations in MLSS concentration in the same unit during different phases of operation are shown. In cases in which influent BOD was less than 40 mg/ℓ, the amount of ammonia removed was roughly proportional to the MLSS concentration, up to some optimal concentration for the unit. Comparisons of the different units on the basis of $\frac{\text{mg } NH_3\text{-N removed}}{\text{mg MLSS}}$ we consider to be invalid. Biological examination of the sludge in the five units revealed significant differences in the flora and fauna. A six-week study of the protozoa in the units indicated marked differences in both numbers of protozoa and in species present (James and Little, 52). While large numbers of protozoa, especially stalked ciliates, were present at the shorter detention times, very few protozoa were present at the longer detention times. In order to make a valid assessment of the relationship of MLSS concentration to ammonia removal, it will be necessary to find some way to measure the relative weight of nitrifying bacteria in each sludge.

The possible enhancement of nitrification by activated sludge treatment following high-rate trickling filtration is indicated in Tables 6-11 and 6-12. Change in concentration of various nitrogen forms during treatment, from the plant influent, filter effluent, and plant effluent to the effluents from the activated sludge pilot units, is shown in Table 6-11. Note that during cold seasons little nitrogen removal occurred in the main plant; in warm seasons some nitrogen removal occurred, and a

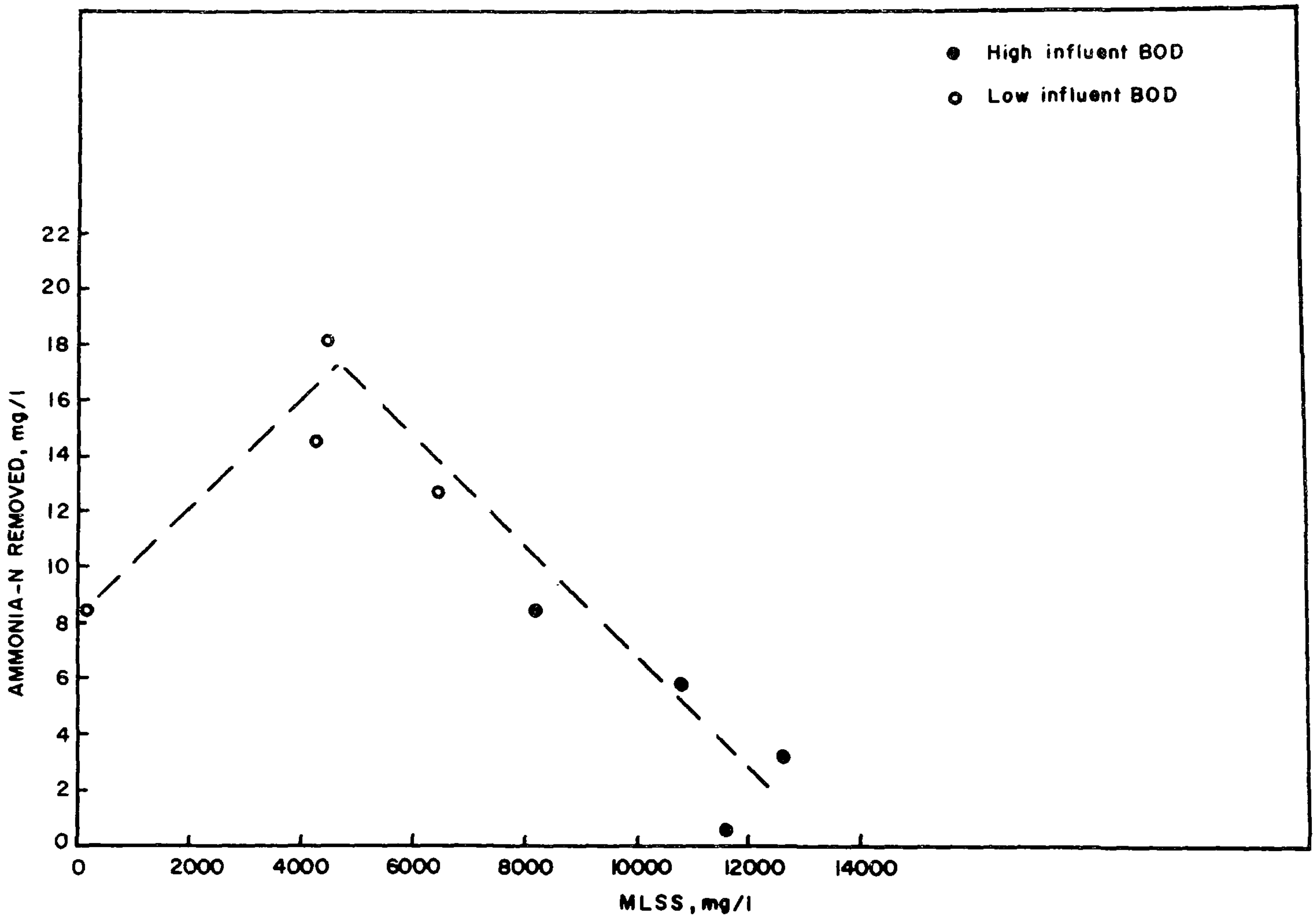


FIGURE 6-11 -- AMMONIA REMOVAL AS A FUNCTION OF MIXED LIQUOR SUSPENDED SOLIDS CONCENTRATION, UNIT 1.

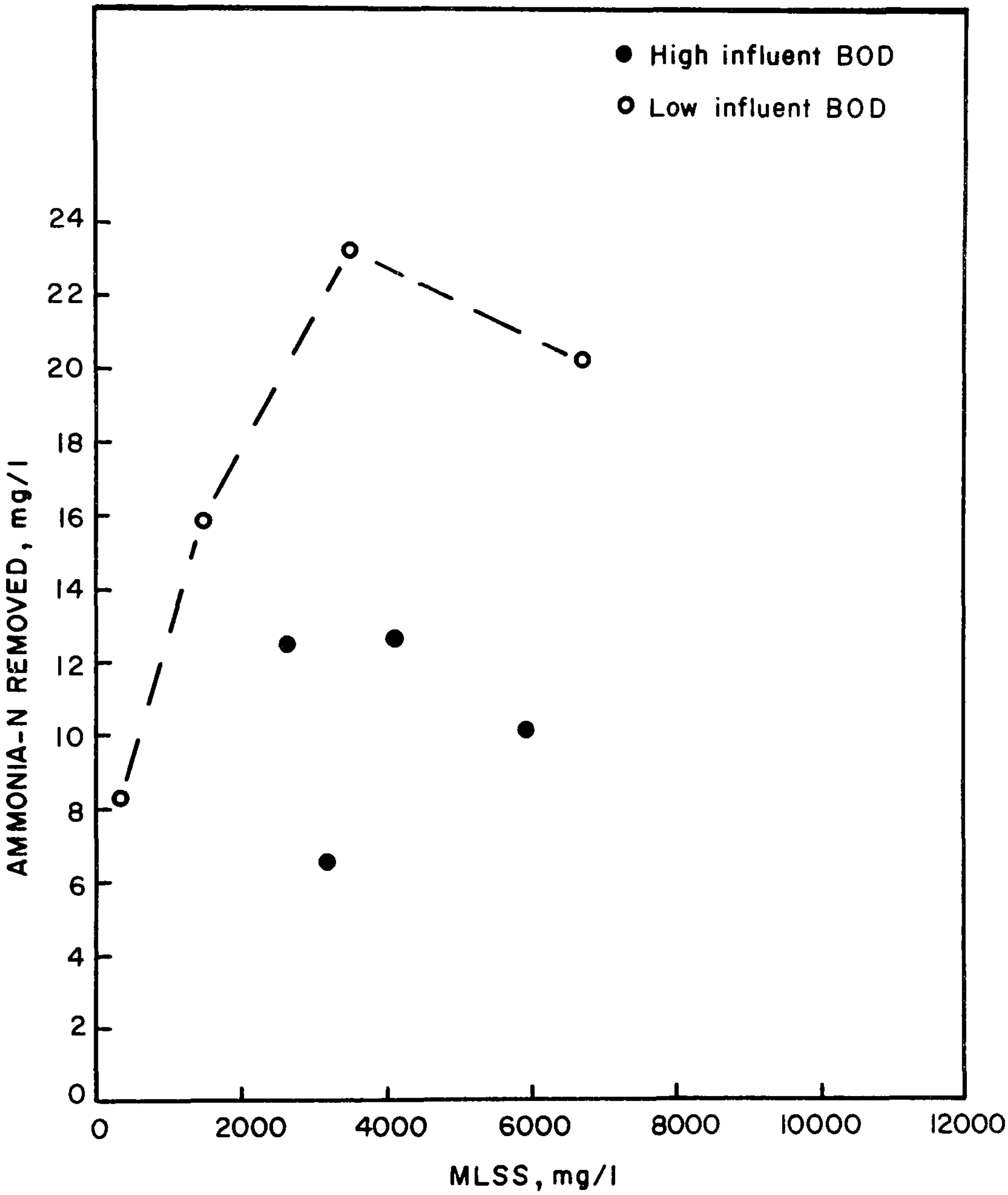


FIGURE 6-12. AMMONIA REMOVAL AS A FUNCTION MIXED LIQUOR SUSPENDED SOLIDS CONCENTRATION, UNIT 2.

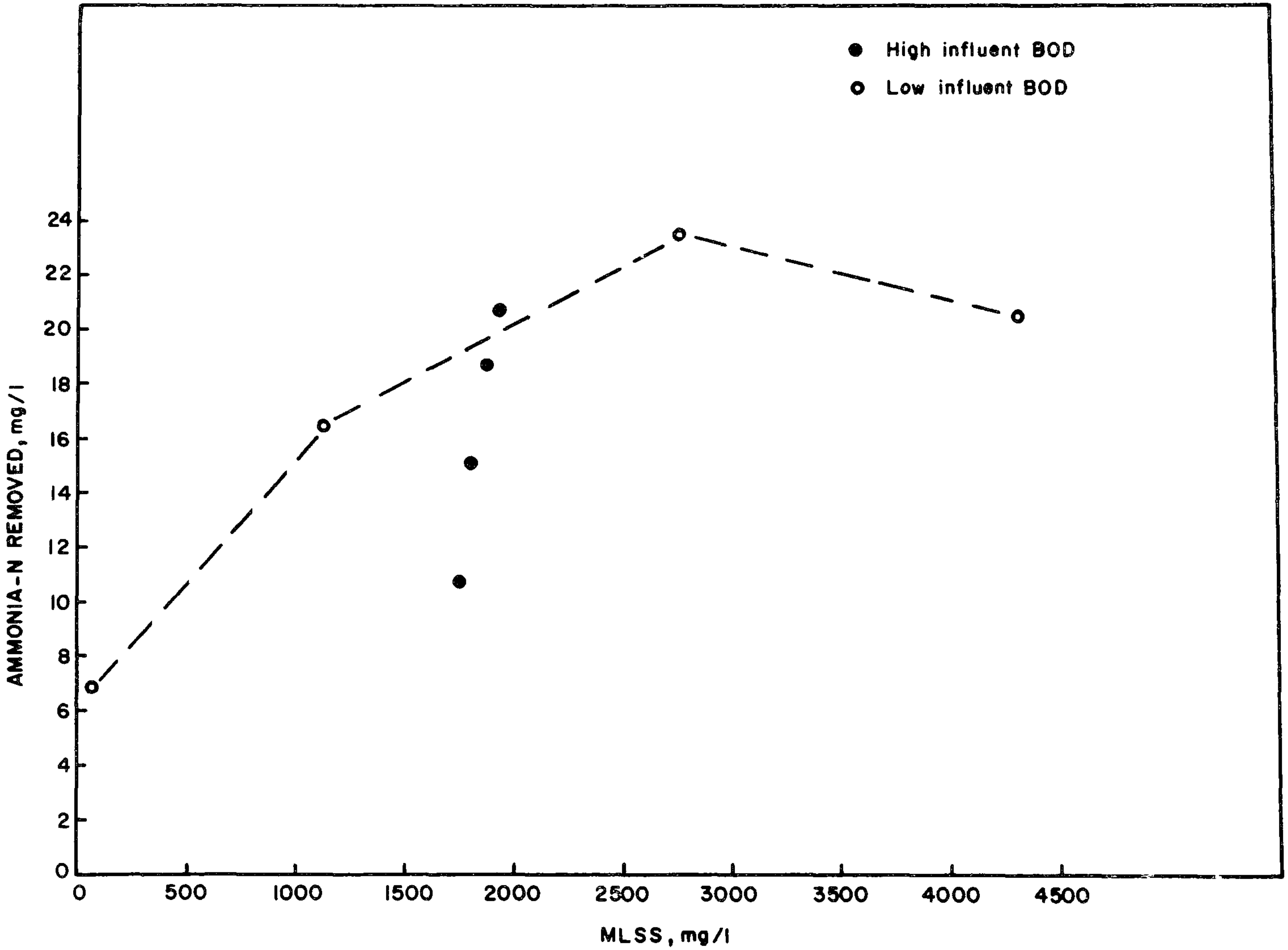


FIGURE 6-13 -- AMMONIA REMOVAL AS A FUNCTION OF MIXED LIQUOR SUSPENDED SOLIDS CONCENTRATION, UNIT 3.

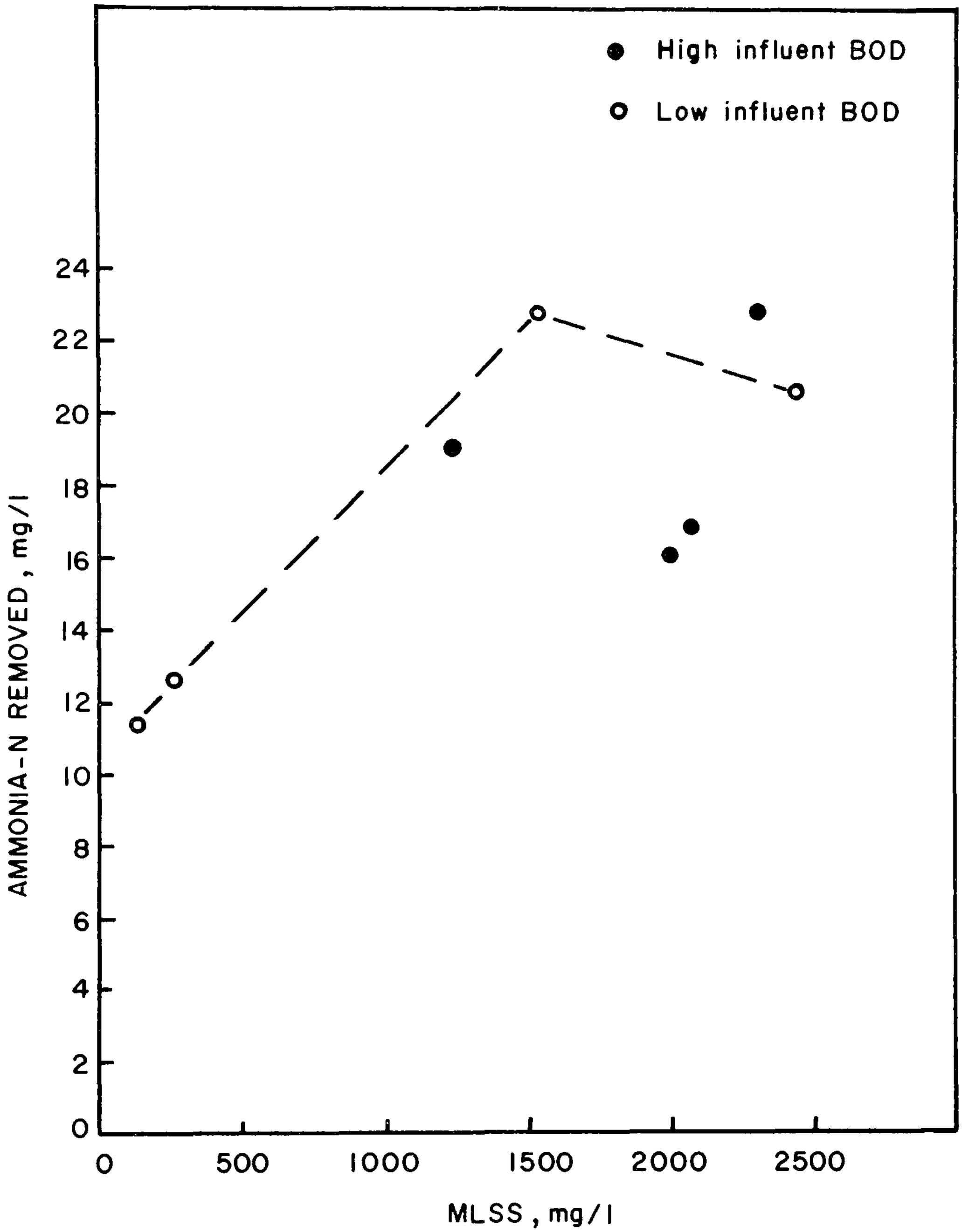


FIGURE 6-14. AMMONIA REMOVAL AS A FUNCTION MIXED LIQUOR SUSPENDED SOLIDS CONCENTRATION, UNIT 4.

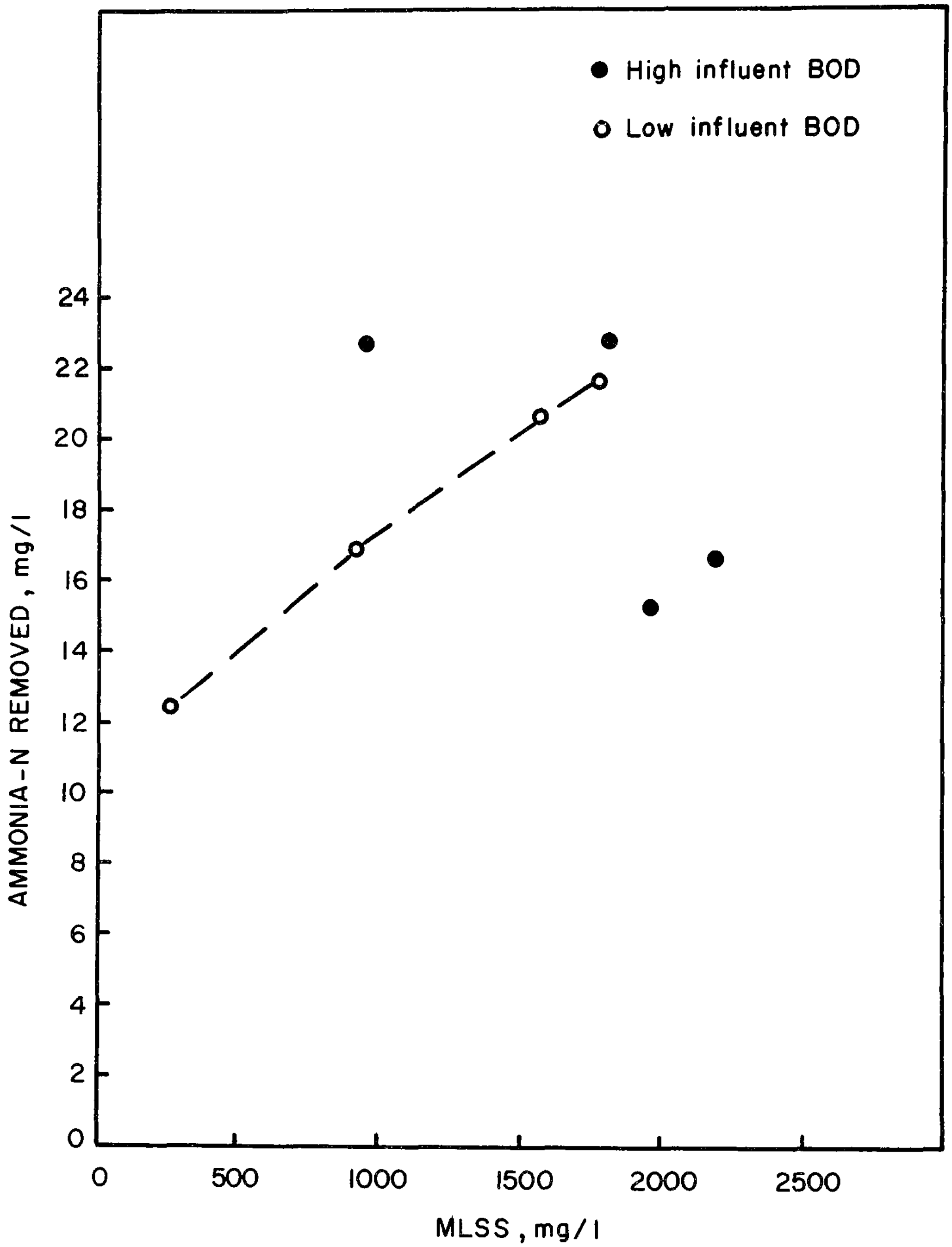


FIGURE 6-15. AMMONIA REMOVAL AS A FUNCTION MIXED LIQUOR SUSPENDED SOLIDS CONCENTRATION, UNIT 5.

TABLE 6-11. CHANGES IN CONCENTRATION OF VARIOUS NITROGEN FORMS DURING TREATMENT

Phase	Form	N-Concentration (mg/ℓ)							
		Plant Influent	Filter Effluent*	Plant Effluent	Activated Sludge Pilot Plants A-1	A-2	A-3	A-4	A-5
I	Kjeld	35.7	38.3	31.8	59.0	23.2	12.3	10.7	11.0
	NH_3	20.0	22.8	21.0	22.4	12.6	6.6	6.0	7.6
	NO_2^-		0.10		0.15	1.72	0.76	0.45	0.60
	NO_3^-		0.43		0.35	1.60	12.12	15.40	16.40
	Total		38.8		59.5	26.5	25.2	26.6	28.0
II	Kjeld	37.6	34.7	33.5	62.4	27.1	14.6	6.5	6.1
	NH_3	22.2	19.4	22.5	16.3	13.0	8.8	3.3	2.8
	NO_2^-		0.04		0.26	2.16	1.17	0.20	0.15
	NO_3^-		0.64		0.36	1.06	4.94	11.68	13.96
	Total		35.38		63.0	30.3	20.7	18.4	20.2
III	Kjeld	33.0	30.0	30.0	29.5	17.1	7.1	9.0	3.9
	NH_3	22.5	24.0	24.0	18.3	11.5	3.3	1.1	1.2
	NO_2^-		0.02		0.26	1.11	0.82	0.05	0.05
	NO_3^-		0.35		1.19	5.2	12.8	15.6	16.3
	Total		30.4		31.0	23.4	20.7	24.6	20.2
IV	Kjeld	35.5	24.9	22.3	10.2	9.3	6.2	11.2	5.2
	NH_3	22.0	17.4	17.6	3.0	1.6	0.9	4.7	0.5
	NO_2^-		0.04		0.5	0.7	0.37	0.93	0.14
	NO_3^-		0.39		9.2	12.0	13.4	8.8	15.1
	Total		25.3		19.9	22.0	20.0	20.9	20.4
V	Kjeld	31.4	16.9	17.5	8.0	9.8	10.7	5.1	3.6
	NH_3	22.1	13.0	13.2	4.6	4.7	6.2	1.6	0.52
	NO_2^-		0.17		0.44	0.34	0.30	0.49	0.07
	NO_3^-		0.39		6.04	5.6	4.3	8.3	11.0
	Total		17.7		14.5	15.7	15.3	13.9	14.7
VI	Kjeld	31.7	26.1	26.4	15.1	4.9	3.8	3.2	4.1
	NH_3	23.5	21.3	22.4	8.6	1.1	0.9	0.6	0.6
	NO_2^-		0.03		0.57	0.13	0.08	0.05	0.05
	NO_3^-		0.46		4.1	10.3	11.5	12.6	12.8
	Total		26.6		19.8	15.3	15.4	15.8	17.0
VII	Kjeld	36.9	29.4	30.1	13.9	6.7	7.0	7.7	8.2
	NH_3	23.9	26.3	24.5	8.2	3.1	2.8	3.5	4.7
	NO_2^-		0.04		0.75	0.23	0.07	0.04	0.02
	NO_3^-		0.33		7.2	10.1	11.8	11.2	11.8
	Total		29.8		21.8	17.0	18.9	18.9	20.0
VIII	Kjeld	32.9	31.6	31.9	26.6	33.5	27.3	19.2	8.9
	NH_3	22.6	26.8	22.5	18.6	14.1	11.7	7.8	4.2
	NO_2^-		0.03		0.11	0.30	0.19	0.10	0.12
	NO_3^-		0.28		0.97	3.10	5.60	7.50	10.5
	Total		31.9		27.7	36.9	33.1	26.8	19.5

*Influent to activated sludge units

TABLE 6-12. CHANGE IN NITROGENOUS OXYGEN DEMAND (NOD) OF WASTEWATER WITH DIFFERENT DEGREES OF TREATMENT

Phase	Sample Type	NOD Plant Influent	Filter Effluent	Plant Effluent	Activated Sludge Pilot Plants A-1	A-2	A-3	A-4	A-5
I	Uncent.	154	167	138	255	100	53	46	48
	Cent.		132		110	68	40	29	34
II	Uncent.	163	150	145	270	117	63	28	27
	Cent.		119		87	73	44	21	16
III	Uncent.	143	130	130	128	74	31	39	17
	Cent.		108		90	63	26	9	9
IV	Uncent.	154	108	96	44	40	27	48	22
	Cent.		85		30	17	15	31	12
V	Uncent.	136	73	76	35	42	46	22	16
	Cent.		64		28	31	39	16	10
VI	Uncent.	137	113	114	65	21	16	14	18
	Cent.		97		42	12	10	8	7
VII	Uncent.	160	127	130	60	29	30	33	36
	Cent.		117		47	20	20	21	24
VIII	Uncent.	142	137	138	115	145	118	83	38
	Cent.		130		80	68	54	44	25

*Influent to activated sludge units

higher percentage of the influent nitrogen was converted to ammonia. At no time did nitrate concentration in the filter effluent average more than about 0.7 mg/ℓ. Effluents from the activated sludge pilot units, operated year-round at 25 C, always contained significant amounts of nitrate except under conditions of high loading and short detention time. Table 6-12 shows the changes in nitrogenous oxygen demand which can be achieved with tertiary activated sludge treatment.

Nitrogenous oxygen demand (NOD) was calculated assuming that all the Kjeldahl nitrogen would ultimately be converted to ammonia nitrogen. The oxygen demand of each milligram of ammonia-nitrogen was estimated at 4.33 mg O_2 (53). In addition, Table 6-12 indicates the improved NOD removals which could be achieved with improved solids removal, based on kjeldahl nitrogen concentration before and after centrifugation. As pointed out previously, the pilot settling basins did not achieve effective solids removal.

From these investigations, the following conclusions seem warranted:

1. the tertiary activated sludge process is capable of considerable reduction of the NOD in trickling filter effluent
2. the amount of NOD reduction is largely a function of detention time and BOD loading
3. in continuously operated units allowed to operate at pH levels below 7 the effect of pH on extent of nitrification does not appear to be as important as indicated by previous investigators
4. the effects of pH and alkalinity require further study so that the relative importance of each factor can be determined
5. to formulate a valid description of the relationship of MLSS concentration to nitrifying activity, a method of determining the relative number of nitrifiers in a given sample of sludge must be devised.

Further development and refinement of models such as those proposed by Downing and Knowles (54) and by Lijklema (55) would be facilitated if the numbers of nitrifiers in sludge could be accurately determined.

B. 3.0 GPM ACTIVATED SLUDGE PILOT PLANTS

1. Design

Because the results of the experiments with the 0.1 gpm activated sludge pilot plants were encouraging, three activated sludge pilot plants were constructed to permit operation on a reasonably large scale (3 gpm) to investigate further the effects of aerator detention and other parameters on performance. Each plant consisted of an aeration tank, final settling tank, sludge return pump, air compressor, automatic sampling system and all necessary control facilities.

TABLE 6-13

Design Data - 3 GPM Activated Sludge Pilot Plants

Parameter	Aerator 1	Aerator 2	Aerator 3	Settling Tanks
Return Sludge Flow (GPM)				2.25
Diameter	24"	32"	48"	48"
Height of Conical Section	36"	48"	72"	72"
Height of Water in Cylindrical Section	60"	48"	24"	21"
Free Board	20"	20"	20"	23"
Total Heights of Tank	116"	116"	116"	116"
Total Volume (ft^3)	18.8	29.8	50.3	47.2
Total Volume (Gal)	141	224	376	353
Influent Flow (GPM)	3.0	3.0	3.0	
Detention Time (Hrs.)	0.8	1.25	2.1	1.96

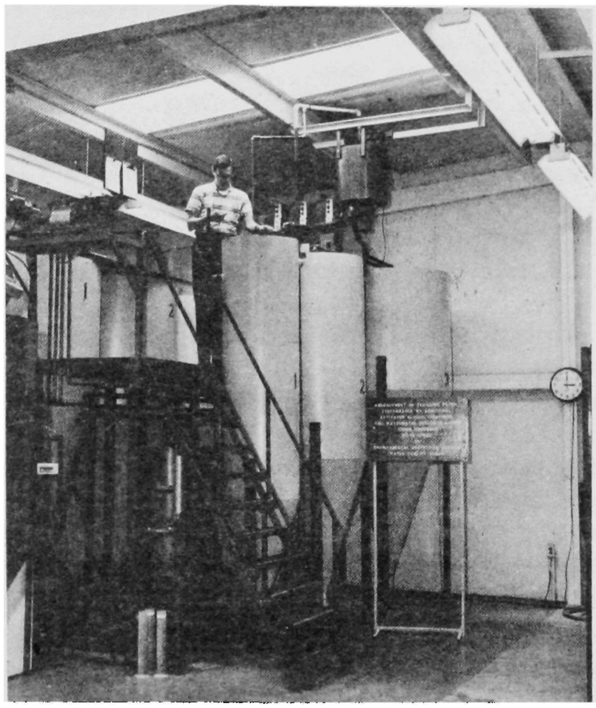


FIGURE 6-16. PHOTOGRAPH OF LARGE ACTIVATED SLUDGE PILOTS. AERATORS TO RIGHT SETTLING TANKS AT LEFT.

To prevent accumulation of solids in the totally mixed aeration tanks, the tanks were constructed with conical bottoms, with air introduced at the bottom tip of the cone. Because it was desired to avoid mechanical sludge removal equipment, the final settling tanks also were constructed with conical bottoms, having side slopes of 3:1 (vertical to horizontal) to insure satisfactory movement of sludge to an outlet located at the tip of the cone.

At this scale of operation, it is impossible to produce identical hydrodynamic effects in final settling tanks of different sizes. Because the variables of prime interest included aerator detention times and various loading parameters, not final settling, it was decided that the three plants would be operated at the same hydraulic flow, using identical final settling tanks to avoid the hydrodynamics problem. Different detention times and loadings were obtained by using three different size aeration tanks. These did represent valid hydrodynamic equivalents because they were totally mixed, making size and shape relatively unimportant. Design characteristics of all tanks in the pilot plants are summarized in Table 6-13 and the plants are shown in Figure 6-16.

The total influent flow for all three plants was pumped from the effluent of a Chapel Hill trickling filter, using a variable-speed rubber impeller pump. This flow was divided continuously into three identical portions by using a specially-designed rotating flow-splitter. Each plant was equipped with a rotameter for measuring air flow. Additions of air were regulated to maintain dissolved oxygen in the aeration tank at all times equal to or greater than 1.0 mg/ℓ. Return sludge was pumped continuously from the final settling tanks to aeration tanks by means of variable-speed rubber impeller pumps.

2. Plant Operation

The influent to these plants consisted of effluent from a trickling filter in the Chapel Hill Treatment Plant. Because the full-scale plant was operated throughout this project on an experimental basis, with periodic changes in recirculation ratio and rate of flow application, influent quality to the activated sludge pilot plants varied in response to changes in the main plant operation as well as the usual seasonal and other variations in the process.

Unlike the smaller activated sludge studies reported earlier, there was no effort to control temperature in the 3 gpm activated sludge plants. Accordingly, temperature in the aerators varied with changes in temperature of the trickling filter effluent. Of course, because these units were located in a heated building, there was little or no further change after introduction into the aeration tanks, as might have been expected if the plants had been operated outside in an exposed location.

Dissolved oxygen in the aeration tank was maintained in the range of 1.0-4.0 mg/ℓ at all times. Sludge was wasted three times a day from the system.

Samples of influent to the units and overflow from each settling tank were collected for one day three times per week. Each composite was collected automatically by pumping equal volumes, at 30-minute intervals, into refrigerated containers. The sampling system was designed to purge the sample lines automatically before diverting a portion of flow into the sample container.

Analyses were conducted for BOD_5, total organic carbon (TOC), suspended solids (SS), volatile suspended solids (VSS), Kjeldahl nitrogen (Kjeld-N), ammonia nitrogen (NH_3-N), oxidized nitrogen (NO_2 - N + NO_3-N), total phosphorus (TP), total inorganic phosphorus (TIP), turbidity (JTU), and pH. Grab samples of mixed liquor and return sludge were analyzed for suspended solids (MLSS and RSSS) and volatile suspended solids (MLSS and RSVSS). Daily measurements were made of dissolved oxygen (oxygen probe method), temperature, influent flow rate, return sludge flow rate, and settleable mixed liquor solids.

Because results obtained from the smaller activated sludge units had indicated the importance of solids carryover from the final tanks, composite samples from the larger plants were analyzed "as is" and centrifuged (2200 g, International Model UV Centrifuge) for BOD, TOC and Kjeld-N.

3. Results and Discussion

The original intent was to conduct studies at various BOD/solids loadings by adjusting the rate of sludge wasting. It was determined that wasting MLSS on a predetermined pattern would not control the solids adequately because MLSS varied markedly even during extended periods in which daily wasting was maintained at a constant rate. Daily calculation of the proper amount of sludge to waste to maintain a specified MLSS was impractical because a very large, but unknown, proportion of all solids in the system at any given time was in the settling tank, which was larger than the aerator.

Statistical analyses of preliminary data indicated no significant correlation between BOD, solids loading and performance. The only clear correlation established was between detention time in the aerator and performance. An exception was that the degree of nitrification (ammonia removal during treatment), increased with aeration time and concentration of MLSS, when influent BOD was less than 40 mg/ℓ (Figure 6-17). This also had been observed in data from the 0.1 gpm activated sludge units, described earlier.

Because of the difficulty in maintaining constant MLSS, variation in solids during any given experimental period was found to be about as great as that between successive experimental periods. Examination of data for the different chronological periods of experimentation indicated that the most reasonable approach appeared to be to combine results for the entire period from July 1, 1971 through January 27, 1972.

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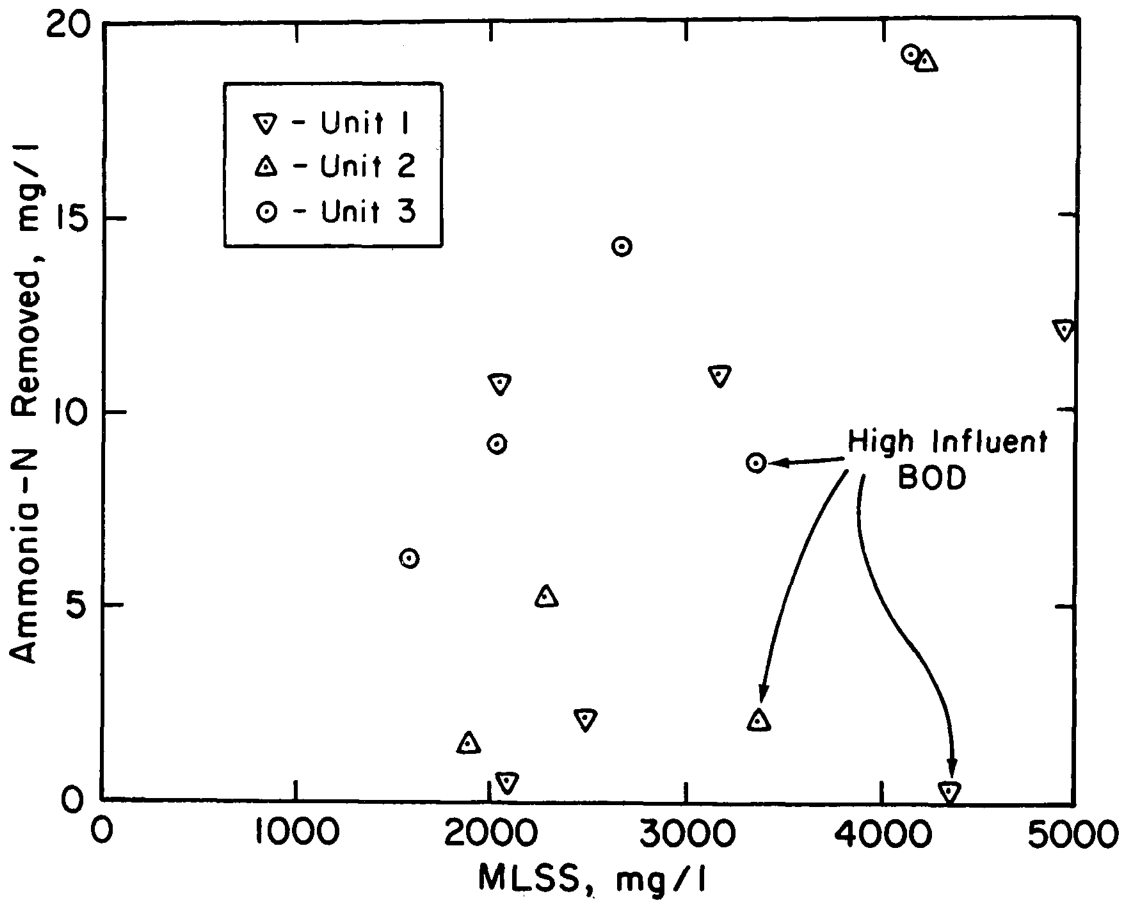

FIGURE 6-17. AMMONIA REMOVAL AS A FUNCTION MIXED LIQUOR SUSPENDED SOLIDS.

Mixed liquor suspended solids tended to decrease with increasing detention time in the aeration system. The sludge volume index for all units was within a range generally considered to be acceptable (56), but as pointed out by Dick and Vesilind (57) this really is not a very good performance criterion. Aerator loadings (g BOD/gMLSS/day) fell within ranges generally representative of many plants in practice (58).

Table 6-14 summarizes characteristics of untreated sewage, trickling filter effluent, and effluent from each of the three activated sludge pilot units. Based on data for BOD and TOC in Table 6-14 and Figure 6-18, the activated sludge units gave significant but not radical improvement in plant performance beyond the trickling filters. BOD removal increased by 3-8% and TOC removal increased by 5-7%. Suspended solids removal were not improved by addition of activated sludge to the main plant, although turbidity was significantly better. Effluent suspended solids reflect the same poor quality of settling observed earlier with the smaller activated sludge pilot units.

Figures for soluble BOD and soluble TOC show the type of performance which could be anticipated with removal of fine solids from the plant effluent. Removal of suspended material, perhaps by filtration, from the trickling filter effluent would increase overall performance from 78% to 88% BOD removal, approximately 50% removal of BOD in the current plant effluent. Addition of activated sludge unit including removal of solids, would give substantial further improvement to produce overall performance of 93-94% BOD removal. Although TOC removals are somewhat lower, as expected, they show the same types of trends observed for the BOD data.

The most striking change in performance attending addition of the activated sludge system is reflected in large decreases in Kjeld-N. This can be attributed to more complete nitrification in the activated sludge units. The nitrogenous oxygen demand (NOD) of effluent from the main plant averaged 121 mg/ℓ, a figure which was reduced in the activated sludge effluents to 66, 54, and 41 mg/ℓ, with increasing detention times. This produces a very significant improvement in removal of oxygen demand, when considering both carbonaceous and nitrogenous materials (Figure 6-19).

Further, it may be noted that addition of the activated sludge units resulted in substantial decrease in total nitrogen content of the effluents, presumably because of denitrification in the final settling tanks. Gas formation was observed in those tanks frequently and this could have contributed to relatively poor solids removal by those units.

The data suggest that addition of this activated sludge modification, with detention periods of 0.9-2.3 hrs, could improve BOD removal by a trickling filter plant, but only slightly unless additional steps are taken to remove suspended materials from the effluent. Without solids removals it appears that addition of the activated sludge would not be

TABLE 6-14

PERFORMANCE OF CHAPEL HILL TRICKLING FILTER PLANT
AND
3 GPM ACTIVATED SLUDGE PILOT PLANTS*

	Chapel Hill Plant		Activated Sludge Pilot Plants		
Parameter	Influent	Effluent	Effluent #1	Effluent #2	Effluent #3
BOD_5	159 ± 35	35 ± 20	25 ± 14	30 ± 17	22 ± 14
Soluble BOD_5		19 ± 11	12 ± 11	10 ± 13	8 ± 11
Ultimate BOD (BOD_5 + NOD)**	302	156	91	84	63
TOC	137 ± 36	41 ± 24	33 ± 10	35 ± 11	32 ± 12
Soluble TOC		33 ± 7	23 ± 5	23 ± 6	18 ± 5
Suspended Solids	157 ± 38	32 ± 18	34 ± 23	36 ± 19	37 ± 26
Turbidity	71 ± 10	28 ± 9	14 ± 5	16 ± 6	15 ± 8
NH_3-N	22 ± 4.2	21 ± 5.2	12.3 ± 5	10.0 ± 6	6.7 ± 5
Kjeld-N	33 ± 8.5	28 ± 7.7	15.2 ± 5	12.6 ± 5	9.5 ± 4
NO_2 + NO_3-N	0.9 ± 3.2	1.2 ± 3.2	4.3 ± 2	6.7 ± 3	11.6 ± 4
Soluble Kjeld-N		14.3 ± 4.7	13.8 ± 4.0	12.1 ± 4.0	8.2 ± 3.8
pH	7.1 ± 0.2	7.1 ± 0.2	7.0 ± 0.2	6.8 ± 0.3	6.5 ± 0.4
Total P	10.2 ± 1.8	9.0 ± 1.4	8.8 ± 1.3	8.8 ± 1.6	8.6 ± 1.5
Total Inorganic P	9.1 ± 1.4	8.1 ± 1.4	7.6 ± 1.0	7.6 ± 1.0	7.6 ± 1.0

*All values in mg/ℓ except pH and turbidity
**Calculated as 4.33 (Kjeld-N) after Wezernak and Gannon (53).

FIGURE 6-18. AVERAGE PER CENT BOD REMOVAL OF BOD_5 AND ORGANIC CARBON WITH AND WITHOUT SUBSEQUENT SOLIDS REMOVAL FOR THE MAIN PLANT (SHADED) AND THE ADDITIONAL REMOVAL IN THE ACTIVATED SLUDGE PILOTS (OPEN).

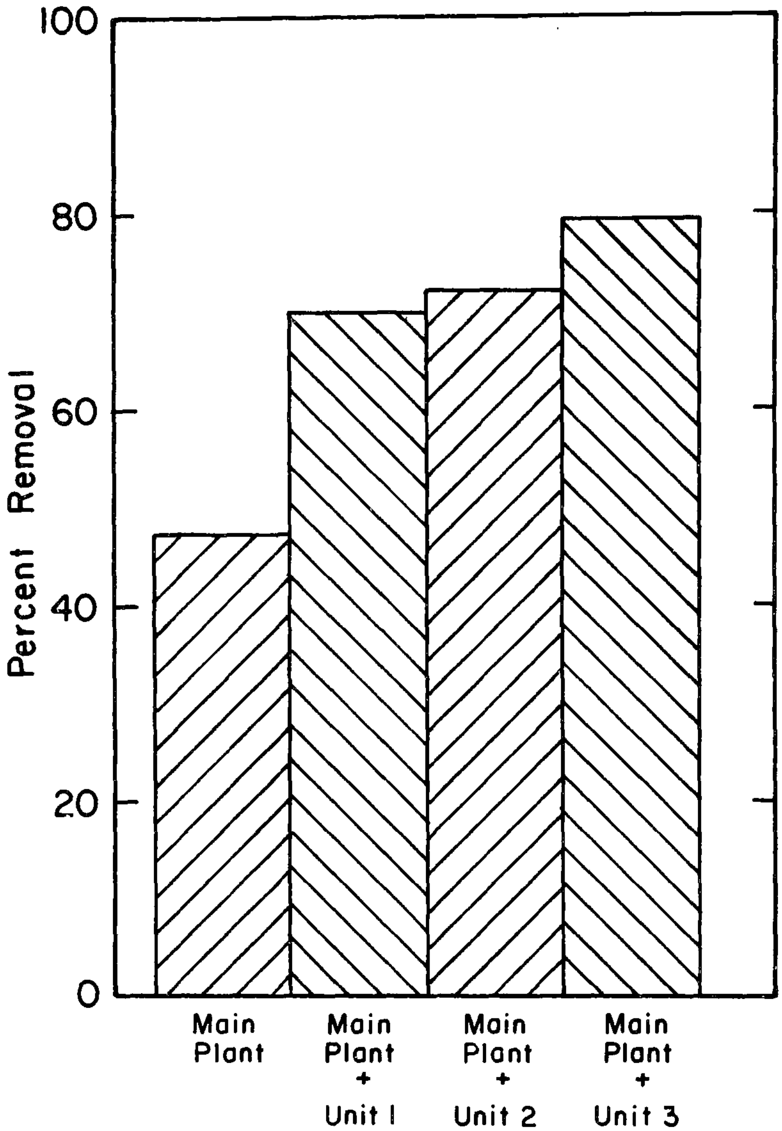

FIGURE 6-19. PERCENT REMOVAL OF ULTIMATE BOD *
IN THE MAIN PLANT AND MAIN PLANT
WITH ACTIVATED SLUDGE PILOT PLANTS.

*CALCULATED AS BOD_5 + 4.33 (KJELD-N)
AFTER WEZERNAK AND GANNON (53).

advantageous unless the increase in nitrification would provide sufficient justification, which would be unlikely in most instances.

Combination of the activated sludge modification with filtration or other treatment appropriate for removing suspended material would produce substantially improved performance, with BOD removals exceeding 90%. One appropriate means for suspended solids removal would be in conjunction with chemical precipitation-flocculation for phosphorus removal. In this instance, effluent quality should be excellent, with potential for very low BOD, substantial nitrification and removal of most phosphorus.

Section VII

REFERENCES

Section VII

REFERENCES

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APPENDIX A

DATA LISTING FOR MAIN PLANT NOVEMBER, 1969 TO JANUARY, 1970

CONTENTS

Description of Data Listing Format

All of the routine data collected on the Chapel Hill Main Plant from November 19, 1969 to January 24, 1972 are listed in this appendix. The data list is in seven sections. Each section lists a different group of variables for the entire period of data collection. The date, day of week, and sample types are repeated in each section. Blanks in the tables indicate that the particular parameter was not determined on that date with the given sample type.

As discussed in Section V, the main plant consists of two parallel units, Side 1 and Side 2. The numbers in the variable labels refer to the side of the plant. Samples were routinely collected at seven points of flow. These were influent (labelled INF), primary tank effluent (labelled P-1 or P-2), trickling filter effluent (labelled F-1 or F-2), and final settling tank effluent (labelled S-1 or S-2).

The variable "Samp Type" refers to the type of sample (composite, grab, etc.) on which the analyses in a given line of data were made. The description of the code is in the next section. On many dates two different types of samples were collected. These dates are listed twice with the values of each variable appearing on the line with the appropriate sample type. Hydraulic data is listed for each line in the file. Thus, if the date appears twice, the hydraulic data will also appear twice.

Variable Definitions and Units

1. Samp Type = Sample type (see next section for code)
2. Total Flow = Flow in mgd into the head end of the plant
3. Max. Flow = Maximum total plant flow in mgd during the day
4. Min. Flow = Minimum total plant flow in mgd during the day
5. FRCT = Fraction of total flow passed to indicated side
6. Flow = Flow in mgd to indicated side (FRCT x Total Flow)
7. RCRC = Recirculation flow (mgd) on indicated side
8. RCRC Ratio = Recirculation ratio on indicated side (RCRC/Flow)
9. Temp. = Influent temperature (°C)
10. HYD Load = Hydraulic load (mgad) on trickling filter on indicated side (Flow + RCRC/Filter area)
11. BOD Load = BOD load ($\text{lbs}/1000\ \text{ft}^3/\text{day}$) on trickling filter on indicated side
    (Flow x Inf BOD x 8.34/volume in $\text{ft}^3 \times 10^{-3}$)
12. Org C Load = Organic carbon load ($\text{lbs}/1000\ \text{ft}^3/\text{day}$) on trickling filter on indicated side
    (Flow x Inf Org C x 8.34/volume in $\text{ft}^3 \times 10^{-3}$)
13. BOD EFF = BOD removal efficiency (%) on indicated side

$$100 \left(\frac{\text{Inf BOD} - \text{S BOD}}{\text{Inf BOD}}\right)$$

14. SS EFF = Suspended solids removal efficiency (%) on indicated side

$$100 \left(\frac{\text{Inf SS} - \text{S SS}}{\text{Inf SS}}\right)$$

15. Org C EFF = Organic carbon removal efficiency (%) on indicated side

$$100 \left(\frac{\text{Inf Org C} - \text{S Org C}}{\text{Inf Org C}}\right)$$

16. BOD = Five day 20° C biochemical oxygen demand (mg/ℓ) at indicated point
17. SS = Suspended solids (mg/ℓ) at indicated point
18. Org C = Total organic carbon (mg C/ℓ) at indicated point
19. NO_2 = Nitrite (mgN/ℓ) at indicated point
20. NO_3 = Nitrate (mgN/ℓ) at indicated point
21. NH_3 = Ammonia (mgN/ℓ) at indicated point
22. KJELD N = Total Kjeldahl nitrogen (mgN/ℓ) at indicated point
23. Totl In P = Total inorganic phosphorus (mgP/ℓ) at indicated point
24. Totl P = Total phosphorus (mgP/ℓ) at indicated point
25. Turb = Turbidity (JTU) at indicated point
26. pH = pH at indicated point

Code Definitions for Sample Type Variable

Code	Definition
missing or 99	= No chemistry sample taken
04	= 2-day time proportional composite
06	= 1-day time proportional composite
07	= 3-day time proportional composite
10	= 2-part composite of 1-day time proportional composites
11	= 12-hour time proportional composite
12	= 3-part composite of 1-day time - proportional composites
13	= 1-day time proportional composite with BOD_6
15	= 1-day flow proportional composite

Contents of Data Files

Data Listing of Total Flow, Maximum Flow, Minimum Flow, Fraction to Side 1, Fraction to Side 2, Flow Side 1, Flow Side 2, Recirculation Flow Side 1, Recirculation Flow Side 2, Recirculation Ratio Side 1, Recirculation Ratio Side 2, Influent Temperature, Hydraulic Load Side 1, Hydraulic Load Side 2, and BOD Load Side 1

Data Listing of BOD Load Side 2, Organic Carbon Load Side 1, Organic Carbon Load Side 2, BOD Removal Side 1, BOD Removal Side 2, Suspended Solids Removal Side 1, Suspended Solids Removal Side 2, Organic Carbon Removal Side 1, Organic Carbon Removal Side 2, Influent BOD, P-1 BOD, F-1 BOD, S-1 BOD, P-2 BOD, F-2 BOD, S-2 BOD

Data Listing of Influent Suspended Solids, P-1 Suspended Solids, F-1 Suspended Solids, S-1 Suspended Solids, P-2 Suspended Solids, F-2 Suspended Solids, S-2 Suspended Solids, Influent Organic Carbon, P-1 Organic Carbon, F-1 Organic Carbon, S-1 Organic Carbon, P-2 Organic Carbon, F-2 Organic Carbon, S-2 Organic Carbon, Influent Nitrite, P-1 Nitrite, and F-1 Nitrite

Data Listing of S-1 Nitrite, P-2 Nitrite, F-2 Nitrite, S-2 Nitrite, Influent Nitrate, P-1 Nitrate, F-1 Nitrate, S-1 Nitrate, P-2 Nitrate, F-2 Nitrate, S-2 Nitrate, Influent Ammonia, P-1 Ammonia, F-1 Ammonia, S-1 Ammonia

Data Listing of P-2 Ammonia, S-2 Ammonia, Influent Kjeldahl, P-1 Kjeldahl, F-1 Kjeldahl, S-1 Kjeldahl, P-2 Kjeldahl, F-2 Kjeldahl, S-2 Kjeldahl, Influent Total Inorganic Phosphorus, P-1 Total Inorganic Phosphorus, F-1 Total Inorganic Phosphorus S-1 Total Inorganic Phosphorus and P-2 Total Inorganic Phosphorus

Data Listing of F-2 Total Inorganic Phosphorus, S-2 Total Inorganic Phosphorus, Influent Total Phosphorus, P-1 Total Phosphorus, F-1 Total Phosphorus, S-1 Total Phosphorus, P-2 Total Phosphorus, F-2 Total Phosphorus, S-2 Total Phosphorus, Influent Turbidity, P-1 Turbidity, F-1 Turbidity, S-1 Turbidity, P-2 Turbidity, F-2 Turbidity, and S-2 Turbidity

Data Listing of Influent pH, P-1 pH, F-1 pH, S-1 pH, P-2 pH, F-1 pH, and S-2 pH

Date of Obsv	Day of Week	Samp Type	Total Flow	Max Flow	Min Flow	FRCT Side 1	FRCT Side 2	Flow Side 1	Flow Side 2	RCBC Side 1	RCBC Side 2	RCBC Ratio 1	RCBC Ratio 2	Temp	HYD Load 1	HYD Load 2	BOD Load 1
NOV 19 69	WED	6	2.370	3.6	0.7	0.50	0.50	1.185	1.185	3.20	3.20	2.70	2.70	20.3	17.0	17.0	
NOV 19 69	WED	4	2.370	3.6	0.7	0.50	0.50	1.185	1.185	3.20	3.20	2.70	2.70	20.3	17.0	17.0	38.8
NOV 20 69	THU	6	2.330	3.5	0.7	0.50	0.50	1.165	1.165	3.20	3.20	2.75	2.75	18.0	16.9	16.9	
NOV 20 69	THU	4	2.330	3.5	0.7	0.50	0.50	1.165	1.165	3.20	3.20	2.75	2.75	18.0	16.9	16.9	38.1
NOV 21 69	FRI	6	2.310	3.5	0.7	0.50	0.50	1.155	1.155	3.20	3.20	2.77	2.77	19.5	16.9	16.9	
NOV 21 69	FRI	7	2.310	3.5	0.7	0.50	0.50	1.155	1.155	3.20	3.20	2.77	2.77	19.5	16.9	16.9	25.5
NOV 22 69	SAT	4	1.950	3.7	0.6	0.50	0.50	0.975	0.975	3.20	3.20	3.28	3.28	18.5	16.2	16.2	
NOV 22 69	SAT	7	1.950	3.7	0.6	0.50	0.50	0.975	0.975	3.20	3.20	3.28	3.28	18.5	16.2	16.2	21.5
NOV 23 69	SUN	4	1.870	3.1	0.6	0.50	0.50	0.935	0.935	3.20	3.20	3.42	3.42		16.0	16.0	
NOV 23 69	SUN	7	1.870	3.1	0.6	0.50	0.50	0.935	0.935	3.20	3.20	3.42	3.42		16.0	16.0	20.6
NOV 24 69	MON	6	2.270	3.5	0.7	0.50	0.50	1.135	1.135	3.20	1.00	2.82	1.00	19.8	16.8		
NOV 24 69	MON	4	2.270	3.5	0.7	0.50	0.50	1.135	1.135	3.20	1.00	2.82	1.00	19.8	16.8		34.0
NOV 25 69	TUE	6	2.180	3.5	0.7	0.50	0.50	1.090	1.090	3.20	3.20	2.94	2.94	19.3	16.6	16.6	
NOV 25 69	TUE	4	2.180	3.5	0.7	0.50	0.50	1.090	1.090	3.20	3.20	2.94	2.94	19.3	16.6	16.6	32.6
NOV 26 69	WED		1.790	3.3	0.6	0.50	0.50	0.895	0.895	3.20	3.20	3.58	3.58	19.9	15.9	15.9	
NOV 27 69	THU		1.260	2.1	0.6	0.50	0.50	0.630	0.630	3.20	3.20	5.08	5.08		14.8	14.8	
NOV 28 69	FRI		1.370	2.5	0.6	0.50	0.50	0.685	0.685	3.20	3.20	4.67	4.67		15.1	15.1	
NOV 29 69	SAT	4	1.320	2.2	0.6	0.50	0.50	0.660	0.660	3.20	3.20	4.85	4.85	17.8	15.0	15.0	14.6
NOV 30 69	SUN	4	1.570	2.6	0.6	0.50	0.50	0.785	0.785	3.20	3.20	4.08	4.08		15.4	15.4	17.3
DEC 1 69	MON	6	2.200	3.4	0.6	0.50	0.50	1.100	1.100	3.20	3.20	2.91	2.91	18.0	16.7	16.7	
DEC 1 69	MON	4	2.200	3.4	0.6	0.50	0.50	1.100	1.100	3.20	3.20	2.91	2.91	18.0	16.7	16.7	26.0
DEC 2 69	TUE	6	2.250	3.5	0.6	0.50	0.50	1.125	1.125	3.20	3.20	2.84	2.84	18.5	16.8	16.8	
DEC 2 69	TUE	4	2.250	3.5	0.6	0.50	0.50	1.125	1.125	3.20	3.20	2.84	2.84	18.5	16.8	16.8	26.6
DEC 3 69	WED	6	2.260	3.5	0.6	0.50	0.50	1.130	1.130	3.20	3.20	2.83	2.83	18.8	16.8	16.8	
DEC 3 69	WED	4	2.260	3.5	0.6	0.50	0.50	1.130	1.130	3.20	3.20	2.83	2.83	18.8	16.8	16.8	26.7
DEC 4 69	THU	6	2.270	3.5	0.7	0.50	0.50	1.135	1.135	3.20	3.20	2.82	2.82	18.6	16.8	16.8	
DEC 4 69	THU	4	2.270	3.5	0.7	0.50	0.50	1.135	1.135	3.20	3.20	2.82	2.82	18.6	16.8	16.8	26.9
DEC 5 69	FRI	6	2.190	3.5	0.6	0.50	0.50	1.095	1.095	3.20	3.20	2.92	2.92	18.0	16.6	16.6	
DEC 5 69	FRI	7	2.190	3.5	0.6	0.50	0.50	1.095	1.095	3.20	3.20	2.92	2.92	18.0	16.6	16.6	
DEC 6 69	SAT	4	1.880	3.3	0.5	0.50	0.50	0.940	0.940	3.20	3.20	3.40	3.40	17.0	16.0	16.0	
DEC 6 69	SAT	7	1.880	3.3	0.5	0.50	0.50	0.940	0.940	3.20	3.20	3.40	3.40	17.0	16.0	16.0	
DEC 7 69	SUN	4	2.040	3.3	0.6	0.50	0.50	1.020	1.020	3.20	3.20	3.14	3.14		16.4	16.4	
DEC 7 69	SUN	7	2.040	3.3	0.6	0.50	0.50	1.020	1.020	3.20	3.20	3.14	3.14		16.4	16.4	
DEC 8 69	MON	6	2.090	3.5	0.6	0.50	0.50	1.045	1.045	3.20	3.20	3.06	3.06	17.9	16.5	16.5	
DEC 8 69	MON	4	2.090	3.5	0.6	0.50	0.50	1.045	1.045	3.20	3.20	3.06	3.06	17.9	16.5	16.5	40.2
DEC 9 69	TUE	6	2.280	3.5	0.6	0.50	0.50	1.140	1.140	3.20	3.20	2.81	2.81	18.1	16.8	16.8	
DEC 9 69	TUE	4	2.280	3.5	0.6	0.50	0.50	1.140	1.140	3.20	3.20	2.81	2.81	18.1	16.8	16.8	43.9
DEC 10 69	WED	6	2.890	4.1	0.7	0.50	0.50	1.445	1.445	3.20	3.20	2.21	2.21	17.5	18.0	18.0	
DEC 10 69	WED	4	2.890	4.1	0.7	0.50	0.50	1.445	1.445	3.20	3.20	2.21	2.21	17.5	18.0	18.0	41.0
DEC 11 69	THU	6	2.510	3.7	0.6	0.50	0.50	1.255	1.255	3.50	3.20	2.79	2.55	17.5	18.4	17.3	
DEC 11 69	THU	4	2.510	3.7	0.6	0.50	0.50	1.255	1.255	3.50	3.20	2.79	2.55	17.5	18.4	17.3	35.6
DEC 12 69	FRI	7	2.360	3.6	0.6	0.50	0.50	1.180	1.180	3.40	3.20	2.88	2.71	17.7	17.8	17.0	28.5
DEC 12 69	FRI	6	2.360	3.6	0.6	0.50	0.50	1.180	1.180	3.40	3.20	2.88	2.71	17.7	17.8	17.0	
DEC 13 69	SAT	7	2.070	3.5	0.7	0.50	0.50	1.035	1.035	3.40	3.20	3.29	3.09	15.1	17.2	16.4	25.0
DEC 13 69	SAT	4	2.070	3.5	0.7	0.50	0.50	1.035	1.035	3.40	3.20	3.29	3.09	15.1	17.2	16.4	
DEC 14 69	SUN	7	2.150	3.1	0.6	0.50	0.50	1.075	1.075	3.40	3.20	3.16	2.98		17.3	16.6	26.0
DEC 14 69	SUN	4	2.150	3.1	0.6	0.50	0.50	1.075	1.075	3.40	3.20	3.16	2.98		17.3	16.6	
DEC 15 69	MON	4	2.330	3.7	0.6	0.50	0.50	1.165	1.165	3.40	3.20	2.92	2.75	17.1	17.7	16.9	39.8
DEC 15 69	MON	6	2.330	3.7	0.6	0.50	0.50	1.165	1.165	3.40	3.20	2.92	2.75	17.1	17.7	16.9	
DEC 16 69	TUE	6	2.230	3.6	0.6	0.50	0.50	1.115	1.115	1.50	1.50	1.35	1.35	17.0	10.1	10.1	
DEC 16 69	TUE	4	2.230	3.6	0.6	0.50	0.50	1.115	1.115	1.50	1.50	1.35	1.35	17.0	10.1	10.1	38.0
DEC 17 69	WED	6	2.150	3.6	0.6	0.50	0.50	1.075	1.075	1.40	1.50	1.30	1.40	17.1	9.6	10.0	
DEC 17 69	WED	4	2.150	3.6	0.6	0.50	0.50	1.075	1.075	1.40	1.50	1.30	1.40	17.1	9.6	10.0	

Date of Obsv	Day of Week	Samp Type	Total Flow	Max Flow	Min Flow	PRCT Side 1	PRCT Side 2	Flow Side 1	Flow Side 2	RCRC Side 1	RCRC Side 2	RCRC Ratio 1	RCRC Ratio 2	Temp	HYD Load 1	HYD Load 2	BOD Load 1
DEC 18 69	THU	6	1.870	3.4	0.6	0.50	0.50	0.935	0.935	1.40	1.50	1.50	1.60	16.2	9.1	9.4	
DEC 18 69	THU	4	1.870	3.4	0.6	0.50	0.50	0.935	0.935	1.40	1.50	1.50	1.60	16.2	9.1	9.4	
DEC 19 69	FRI		1.600	3.0	0.6	0.50	0.50	0.800	0.800	1.40	1.50	1.75	1.88	15.5	8.5	8.9	
DEC 20 69	SAT		1.380	2.2	0.5	0.50	0.50	0.690	0.690	1.40	1.50	2.03	2.17		8.1	8.5	
DEC 21 69	SUN		1.550	2.4	1.1	0.50	0.50	0.775	0.775	1.40	1.50	1.81	1.94		8.4	8.8	
DEC 22 69	MON		1.920	3.4	0.6	0.50	0.50	0.960	0.960	1.40	1.50	1.46	1.56		9.1	9.5	
DEC 23 69	TUE		1.510	2.7	0.6	0.50	0.50	0.755	0.755	1.40	1.50	1.85	1.99		8.4	8.7	
DEC 24 69	WED		1.320	2.5	0.4	0.50	0.50	0.660	0.660	1.40	1.50	2.12	2.27		8.0	8.4	
DEC 25 69	THU		1.480	2.5	0.5	0.50	0.50	0.740	0.740	1.40	1.50	1.89	2.03		8.3	8.7	
DEC 26 69	FRI		1.930	2.9	0.4	0.50	0.50	0.965	0.965	1.40	1.50	1.45	1.55		9.2	9.6	
DEC 27 69	SAT		1.460	2.5	0.6	0.50	0.50	0.730	0.730	1.40	1.50	1.92	2.05		8.3	8.6	
DEC 28 69	SUN		1.320	2.0	0.6	0.50	0.50	0.660	0.660	1.40	1.50	2.12	2.27		8.0	8.4	
DEC 29 69	MON	6	1.580	2.8	0.6	0.50	0.50	0.790	0.790	1.40	1.50	1.77	1.90		8.5	8.9	
DEC 29 69	MON	4	1.580	2.8	0.6	0.50	0.50	0.790	0.790	1.40	1.50	1.77	1.90		8.5	8.9	30.4
DEC 30 69	TUE	6	1.570	2.6	0.6	0.50	0.50	0.785	0.785	1.40	1.50	1.78	1.91		8.5	8.9	
DEC 30 69	TUE	4	1.570	2.6	0.6	0.50	0.50	0.785	0.785	1.40	1.50	1.78	1.91		8.5	8.9	30.2
JAN 1 70	THU		1.890	2.2	0.6	0.50	0.50	0.945	0.945	1.40	1.50	1.48	1.59		9.1	9.5	
JAN 2 70	FRI		1.450	7.5	0.6	0.50	0.50	0.725	0.725	1.40	1.50	1.93	2.07		8.2	8.6	
JAN 5 70	MON		2.210	3.3	0.6	0.50	0.50	1.105	1.105	1.40	1.50	1.27	1.36		9.7	10.1	
JAN 6 70	TUE		2.410	3.4	0.9	0.50	0.50	1.205	1.205	1.40	1.50	1.16	1.24		10.1	10.5	
JAN 7 70	WED		2.420	3.5	0.7	0.50	0.50	1.210	1.210	1.40	1.50	1.16	1.24		10.1	10.5	
JAN 8 70	THU		2.177	3.6	0.7	0.50	0.50	1.088	1.088	1.40	1.50	1.29	1.38		9.6	10.0	
JAN 9 70	FRI		2.272	3.3	0.7	0.50	0.50	1.136	1.136	1.40	1.50	1.23	1.32		9.8	10.2	
JAN 10 70	SAT		2.038	3.5	0.5	0.50	0.50	1.019	1.019	1.40	1.00	1.37	1.00		9.4		
JAN 11 70	SUN		2.229	3.4	0.7	0.50	0.50	1.114	1.114	1.40	1.00	1.26	1.00		9.7		
JAN 12 70	MON		2.389	3.6	0.7	0.50	0.50	1.194	1.194	1.40	1.50	1.17	1.26		10.1	10.4	
JAN 13 70	TUE		2.348	3.6	0.6	0.50	0.50	1.174	1.174	1.40	1.50	1.19	1.28		10.0	10.4	
JAN 14 70	WED		2.251	3.3	0.6	0.50	0.50	1.125	1.125	1.40	1.50	1.24	1.33		9.8	10.2	
JAN 15 70	THU		2.217	3.4	0.6	0.50	0.50	1.108	1.108	1.40	1.50	1.26	1.35		9.7	10.1	
JAN 16 70	FRI		2.201	3.5	0.6	0.50	0.50	1.100	1.100	1.40	1.00	1.27	1.00		9.7		
JAN 17 70	SAT	4	2.079	3.5	0.7	0.50	0.50	1.039	1.039	1.40	1.00	1.35	1.00		9.5		33.3
JAN 18 70	SUN	4	2.055	3.3	0.8	0.50	0.50	1.027	1.027	1.40	1.00	1.36	1.00		9.4		32.9
JAN 19 70	MON	4	2.374	3.4	0.7	0.50	0.50	1.187	1.187	3.00	3.00	2.53	2.53		16.2	16.2	38.0
JAN 20 70	TUE	4	2.302	3.4	0.7	0.50	0.50	1.151	1.151	3.00	1.00	2.61	1.00		16.1		36.9
JAN 21 70	WED	4	2.276	3.3	0.7	0.50	0.50	1.138	1.138	3.00	4.50	2.64	3.95		16.0	21.9	49.8
JAN 22 70	THU	4	2.290	3.4	0.7	0.50	0.50	1.145	1.145	3.00	4.50	2.62	3.93		16.1	21.9	50.1
JAN 23 70	FRI	7	2.161	3.1	0.6	0.50	0.50	1.080	1.080	3.00	4.50	2.78	4.16		15.8	21.6	31.2
JAN 24 70	SAT	7	1.951	3.1	0.6	0.50	0.50	0.975	0.975	3.00	4.50	3.08	4.61		15.4	21.2	28.2
JAN 25 70	SUN	7	1.807	2.9	0.6	0.50	0.50	0.903	0.903	3.00	4.50	3.32	4.98		15.1	20.9	26.1
JAN 26 70	MON	4	2.155	3.4	0.6	0.50	0.50	1.077	1.077	3.00	4.50	2.78	4.18		15.8	21.6	
JAN 27 70	TUE	4	2.044	3.2	0.7	0.50	0.50	1.022	1.022	3.00	3.00	2.94	2.94	14.0	15.6	15.6	
JAN 28 70	WED	4	1.901	3.1	0.7	0.50	0.50	0.950	0.950	3.00	3.00	3.16	3.16	14.0	15.3	15.3	
JAN 29 70	THU	4	2.078	3.0	1.0	0.50	0.50	1.039	1.039	3.00	4.50	2.89	4.33	14.0	15.7	21.5	
JAN 30 70	FRI	7	1.957	3.1	0.6	0.50	0.50	0.978	0.978	3.00	3.00	3.07	3.07		15.4	15.4	
JAN 31 70	SAT	7	1.740	2.6	0.6	0.50	0.50	0.870	0.870	3.00	3.00	3.45	3.45		15.0	15.0	
FEB 1 70	SUN	7	1.770	1.0	1.0	0.50	0.50	0.885	0.885	3.00	3.00	3.39	3.39		15.1	15.1	
FEB 2 70	MON	4	3.172	1.0	1.0	0.50	0.50	1.586	1.586	3.00	3.00	1.89	1.89		17.8	17.8	36.6
FEB 3 70	TUE	4	3.101	4.0	0.5	0.33	0.67	1.023	2.078	1.40	3.00	1.37	1.44	14.0	9.4	19.7	23.6
FEB 4 70	WED	4	2.689	3.9	0.5	0.33	0.67	0.887	1.802	1.40	3.00	1.58	1.67		8.9	18.6	29.5
FEB 5 70	THU	4	2.583	3.7	0.5	0.33	0.67	0.852	1.731	1.40	3.00	1.64	1.73		8.7	18.3	28.3
FEB 6 70	FRI		2.347	3.6	0.7	0.33	0.67	0.775	1.572	1.40	2.80	1.81	1.78		8.4	16.9	
FEB 7 70	SAT	4	2.160	3.5	0.8	0.33	0.67	0.713	1.447	1.40	2.80	1.96	1.93		8.2	16.5	22.1
FEB 8 70	SUN	4	2.014	3.1	0.8	0.33	0.67	0.665	1.349	1.40	2.80	2.11	2.08		8.0	16.1	20.6

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Date of Obsv	Day of Week	Samp Type	Total Flow	Max Flow	Min Flow	PRCT Side 1	PRCT Side 2	Flow Side 1	Flow Side 2	RCRC Side 1	RCRC Side 2	RCRC Ratio 1	RCRC Ratio 2	Temp	HYD Load 1	HYD Load 2	BOD Load 1
FEB 9 70	MON	4	2.530	3.6	0.8	0.33	0.67	0.835	1.695	1.40	2.80	1.68	1.65		8.7	17.4	28.5
FEB 10 70	TUE	4	2.460	3.9	0.7	0.33	0.67	0.812	1.648	1.40	2.80	1.72	1.70		8.6	17.2	27.7
FEB 11 70	WED	4	2.406	3.6	0.7	0.33	0.67	0.794	1.612	1.40	2.80	1.76	1.74	15.0	8.5	17.1	30.6
FEB 12 70	THU	4	2.404	3.6	0.7	0.33	0.67	0.793	1.611	1.40	2.80	1.76	1.74	16.0	8.5	17.1	30.5
FEB 13 70	FRI	7	2.295	3.6	0.7	0.33	0.67	0.757	1.538	1.40	2.80	1.85	1.82	15.0	8.4	16.8	25.4
FEB 14 70	SAT	7	2.020	3.3	0.6	0.33	0.67	0.667	1.353	1.40	2.80	2.10	2.07		8.0	16.1	22.4
FEB 15 70	SUN	7	0.909	3.0	0.6	0.33	0.67	0.300	0.609	1.40	2.80	4.67	4.60		6.6	13.2	10.1
FEB 16 70	MON	4	3.563	4.9	3.3	0.33	0.67	1.176	2.387	1.40	2.80	1.19	1.17	14.0	10.0	20.1	33.3
FEB 17 70	TUE	4	3.392	4.9	1.5	0.33	0.67	1.119	2.273	1.40	2.80	1.25	1.23	13.0	9.8	19.7	31.7
FEB 18 70	WED	4	3.046	3.8	1.2	0.33	0.67	1.005	2.041	1.40	2.80	1.39	1.37	15.0	9.3	18.8	27.4
FEB 19 70	THU	4	2.829	3.8	1.0	0.33	0.67	0.934	1.895	1.40	2.80	1.50	1.48	15.0	9.0	18.2	25.5
FEB 20 70	FRI	7	2.577	3.7	0.8	0.33	0.67	0.850	1.727	1.40	2.80	1.65	1.62	16.0	8.7	17.5	26.3
FEB 21 70	SAT	7	2.290	3.6	0.8	0.33	0.67	0.756	1.534	1.40	2.80	1.85	1.82		8.4	16.8	23.4
FEB 22 70	SUN	7	2.062	3.2	0.7	0.33	0.67	0.680	1.382	1.40	2.80	2.06	2.03		8.1	16.2	21.1
FEB 23 70	MON	4	2.466	3.6	0.7	0.33	0.67	0.814	1.652	1.40	2.80	1.72	1.69	15.0	8.6	17.3	25.6
FEB 24 70	TUE	4	2.437	3.6	0.7	0.33	0.67	0.804	1.633	1.40	2.80	1.74	1.71	15.0	8.5	17.2	25.3
FEB 25 70	WED	4	2.642	3.5	0.9	0.33	0.67	0.872	1.770	1.40	2.80	1.61	1.58		8.8	17.7	32.5
FEB 26 70	THU	4	2.630	3.7	0.8	0.33	0.67	0.868	1.762	1.40	2.80	1.61	1.59	14.0	8.8	17.7	32.4
FEB 27 70	FRI		2.550	3.6	0.9	0.33	0.67	0.841	1.708	1.40	2.80	1.66	1.64	14.0	8.7	17.5	
FEB 28 70	SAT		2.230	3.5	0.8	0.33	0.67	0.736	1.494	1.40	2.80	1.90	1.87		8.3	16.6	
MAR 1 70	SUN		2.071	3.1	0.8	0.33	0.67	0.683	1.388	1.40	2.80	2.05	2.02	14.0	8.1	16.2	
MAR 2 70	MON	4	2.471	3.1	0.7	0.33	0.67	0.815	1.656	1.40	2.80	1.72	1.69	14.0	8.6	17.3	38.5
MAR 3 70	TUE	4	2.460	3.6	0.7	0.33	0.67	0.812	1.648	1.40	2.80	1.72	1.70	14.0	8.6	17.2	38.4
MAR 4 70	WED	4	3.131	3.7	2.8	0.33	0.67	1.033	2.098	1.40	2.80	1.35	1.33	16.0	9.4	19.0	30.4
MAR 5 70	THU	4	3.311	4.1	1.2	0.33	0.67	1.093	2.218	1.40	2.80	1.28	1.26	15.0	9.7	19.5	32.1
MAR 6 70	FRI	7	2.909	4.1	0.7	0.33	0.67	0.960	1.949	1.40	2.80	1.46	1.44	15.0	9.1	18.4	23.7
MAR 7 70	SAT	7	2.385	3.6	1.0	0.33	0.67	0.787	1.598	1.40	2.80	1.78	1.75	15.0	8.5	17.0	19.4
MAR 8 70	SUN	7	2.338	3.1	0.9	0.33	0.67	0.772	1.566	1.40	2.80	1.81	1.79	15.0	8.4	16.9	19.0
MAR 9 70	MON	4	2.623	3.7	0.8	0.33	0.67	0.866	1.757	1.40	2.80	1.62	1.59	14.0	8.8	17.7	24.5
MAR 10 70	TUE	4	2.582	3.8	0.8	0.33	0.67	0.852	1.730	1.40	2.80	1.64	1.62	14.0	8.7	17.6	24.2
MAR 11 70	WED	4	2.531	3.8	0.8	0.33	0.67	0.835	1.696	1.40	2.80	1.68	1.65	14.0	8.7	17.4	21.5
MAR 12 70	THU	4	2.729	3.6	1.8	0.33	0.67	0.901	1.828	1.40	2.80	1.55	1.53		8.9	17.9	23.2
MAR 13 70	FRI	4	1.737	2.7	0.8	0.20	0.80	0.347	1.390	1.00	2.10	2.88	1.51		5.2	13.5	8.9
MAR 14 70	SAT	4	2.258	3.6	0.8	0.20	0.80	0.452	1.806	1.00	1.00	2.21	1.00		5.6		11.6
MAR 15 70	SUN		2.040	3.1	0.8	0.20	0.80	0.408	1.632	1.00	1.00	2.45	1.00		5.5		
MAR 16 70	MON	4	2.547	3.9	0.8	0.20	0.80	0.509	2.038	1.00	1.00	1.96	1.00		5.9		18.2
MAR 17 70	TUE	4	2.453	3.6	0.7	0.20	0.80	0.491	1.962	1.00	1.00	2.04	1.00		5.8		17.5
MAR 18 70	WED	4	2.710	3.9	0.9	0.20	0.80	0.542	2.168	1.50	3.50	2.77	1.61	15.0	7.9	22.0	7.1
MAR 19 70	THU	4	2.690	3.8	1.1	0.20	0.80	0.538	2.152	1.50	3.50	2.79	1.63	15.0	7.9	21.9	7.1
MAR 20 70	FRI		2.933	4.0	1.1	0.20	0.80	0.587	2.346	1.50	3.50	2.56	1.49	15.0	8.1	22.7	
MAR 21 70	SAT		3.226	3.8	2.7	0.20	0.80	0.645	2.581	1.50	3.50	2.32	1.36		8.3	23.6	
MAR 22 70	SUN		3.362	4.1	1.6	0.20	0.80	0.672	2.690	1.50	3.50	2.23	1.30		8.4	24.0	
MAR 23 70	MON	4	3.336	4.5	1.4	0.20	0.80	0.667	2.669	1.50	3.50	2.25	1.31	15.0	8.4	23.9	
MAR 24 70	TUE	4	2.957	4.1	1.1	0.20	0.80	0.591	2.366	0.85	3.50	1.44	1.48	15.0	5.6	22.7	
MAR 25 70	WED	4	2.689	4.0	1.0	0.20	0.80	0.538	2.151	0.85	3.50	1.58	1.63	15.0	5.4	21.9	
MAR 26 70	THU	4	2.258	3.9	0.9	0.20	0.80	0.452	1.806	0.85	3.50	1.88	1.94	15.0	5.0	20.6	
MAR 27 70	FRI		1.911	3.1	0.8	0.20	0.80	0.382	1.529	0.85	3.50	2.22	2.29	15.0	4.8	19.5	
MAR 28 70	SAT		1.592	2.6	0.9	0.20	0.80	0.318	1.274	0.85	3.50	2.67	2.75		4.5	18.5	
MAR 29 70	SUN		1.544	2.3	0.8	0.20	0.80	0.309	1.235	0.85	3.50	2.75	2.83		4.5	18.4	
MAR 30 70	MON	4	2.104	3.2	1.4	0.20	0.80	0.421	1.683	0.85	3.50	2.02	2.08		4.9	20.1	9.3
MAR 31 70	TUE	4	3.132	3.9	1.4	0.20	0.80	0.626	2.506	0.85	3.50	1.36	1.40		5.7	23.3	13.8
APR 1 70	WED		3.599	4.3	2.4	0.20	0.80	0.720	2.879	0.86	3.50	1.19	1.22	16.0	6.1	24.7	
APR 2 70	THU		3.595	4.6	1.8	0.20	0.80	0.719	2.876	0.84	3.00	1.17	1.04	15.0	6.0	22.8	

Date of Obsv	Day of Week	Samp Type	Total Flow	Max Flow	Min Flow	PRCT Side 1	PRCT Side 2	Flow Side 1	Flow Side 2	RCRC Side 1	RCRC Side 2	RCRC Ratio 1	RCRC Ratio 2	Temp	HYD Load 1	HYD Load 2	BOD Load 1
APR 3 70	FRI	7	3.229	4.5	1.3	0.20	0.80	0.646	2.583	0.84	3.37	1.30	1.30	17.0	5.8	23.1	24.1
APR 4 70	SAT	7	2.631	3.9	1.1	0.20	0.80	0.526	2.105	0.84	3.37	1.60	1.60		5.3	21.2	19.6
APR 5 70	SUN	7	2.371	3.6	1.0	0.20	0.80	0.474	1.897	0.84	3.37	1.77	1.78		5.1	20.4	17.7
APR 6 70	MON	4	2.746	4.2	0.8	0.20	0.80	0.549	2.197	0.84	3.37	1.53	1.53	17.0	5.4	21.6	16.4
APR 7 70	TUE	4	2.660	3.8	0.8	0.20	0.80	0.532	2.128	0.84	3.37	1.58	1.58	16.0	5.3	21.3	15.9
APR 8 70	WED	4	2.567	3.8	0.8	0.20	0.80	0.513	2.054	0.84	3.37	1.64	1.64	17.0	5.2	21.0	15.1
APR 9 70	THU	4	2.554	3.7	0.7	0.20	0.80	0.511	2.043	0.84	3.37	1.64	1.65	17.0	5.2	21.0	15.0
APR 10 70	FRI	7	2.397	3.7	0.8	0.20	0.80	0.479	1.918	0.84	3.37	1.75	1.76	17.0	5.1	20.5	15.4
APR 11 70	SAT	7	2.101	3.3	0.7	0.20	0.80	0.420	1.681	0.84	3.37	2.00	2.00		4.9	19.6	13.5
APR 12 70	SUN	7	1.962	2.9	0.7	0.20	0.80	0.392	1.570	0.84	3.37	2.14	2.15		4.8	19.1	12.6
APR 13 70	MON		2.532	4.1	1.3	0.00	1.00	0.000	2.532	0.00	0.00	1.00	0.00	19.0	0.0	9.8	
APR 14 70	TUE		2.532	4.1	1.3	0.00	1.00	0.000	2.532	0.00	0.00	1.00	0.00	17.0	0.0	9.8	
APR 15 70	WED	4	2.575	3.7	1.0	1.00	1.00	1.000	2.575	1.00	1.00	1.00	1.00	18.0			
APR 16 70	THU	4	2.404	3.6	0.9	0.00	1.00	0.000	2.404	0.00	0.00	1.00	0.00	17.0	0.0	9.3	0.0
APR 17 70	FRI	7	2.137	3.4	0.8	1.00	1.00	1.000	2.137	0.00	0.65	1.00	0.30	17.0		10.8	
APR 18 70	SAT	7	1.886	3.0	0.8	1.00	1.00	1.000	1.886	1.00	0.65	1.00	0.34			9.8	
APR 19 70	SUN	7	1.795	2.8	0.7	1.00	1.00	1.000	1.795	1.00	0.65	1.00	0.36			9.5	
APR 20 70	MON		2.096	3.2	0.6	0.00	1.00	0.000	2.096	0.00	0.65	1.00	0.31	20.0	0.0	10.6	
APR 21 70	TUE		2.047	3.2	0.7	0.00	1.00	0.000	2.047	0.00	0.65	1.00	0.32	19.0	0.0	10.5	
APR 22 70	WED		2.029	3.0	0.6	0.00	1.00	0.000	2.029	0.00	0.65	1.00	0.32		0.0	10.4	
APR 23 70	THU		2.465	3.7	0.8	0.00	1.00	0.000	2.465	0.00	0.65	1.00	0.26		0.0	12.1	
APR 24 70	FRI	7	2.330	3.6	0.7	0.00	1.00	0.000	2.330	0.00	0.65	1.00	0.28		0.0	11.6	0.0
APR 25 70	SAT	7	2.018	3.2	0.7	1.00	1.00	1.000	2.018	1.00	0.65	1.00	0.32			10.3	
APR 26 70	SUN	7	1.897	2.8	0.7	1.00	1.00	1.000	1.897	1.00	0.65	1.00	0.34			9.9	
APR 27 70	MON	4	2.450	3.3	0.7	1.00	1.00	1.000	2.450	1.00	0.65	1.00	0.27	21.0		12.0	
APR 28 70	TUE	4	2.523	3.5	0.7	1.00	1.00	1.000	2.523	1.00	0.65	1.00	0.26	20.0		12.3	
APR 29 70	WED	4	2.461	3.5	0.7	1.00	1.00	1.000	2.461	1.00	0.65	1.00	0.26	21.0		12.1	
APR 30 70	THU	4	2.467	3.5	0.7	1.00	1.00	1.000	2.467	1.00	0.65	1.00	0.26	21.0		12.1	
MAY 1 70	FRI	7	2.381	3.6	0.9	1.00	1.00	1.000	2.381	1.00	0.65	1.00	0.27	21.0		11.7	
MAY 2 70	SAT	7	2.152	3.6	0.8	1.00	1.00	1.000	2.152	1.00	0.65	1.00	0.30			10.9	
MAY 3 70	SUN	7	2.189	3.5	0.9	1.00	1.00	1.000	2.189	1.00	0.65	1.00	0.30			11.0	
MAY 4 70	MON		3.055	4.3	1.0	0.00	1.00	0.000	3.055	0.00	0.65	1.00	0.21	19.5	0.0	14.4	
MAY 5 70	TUE		2.696	4.0	0.9	0.00	1.00	0.000	2.696	0.00	0.65	1.00	0.24	20.5	0.0	13.0	
MAY 6 70	WED	4	2.502	3.7	0.7	1.00	1.00	1.000	2.502	1.00	0.65	1.00	0.26	21.0		12.2	
MAY 7 70	THU	4	2.491	3.6	0.8	1.00	1.00	1.000	2.491	1.00	0.65	1.00	0.26	20.0		12.2	
MAY 8 70	FRI		2.332	3.7	0.7	0.00	1.00	0.000	2.332	0.00	0.65	1.00	0.28	23.0	0.0	11.6	
MAY 9 70	SAT		1.869	3.1	0.7	0.00	1.00	0.000	1.869	0.00	0.65	1.00	0.35		0.0	9.8	
MAY 10 70	SUN	6	1.837	2.6	0.7	1.00	1.00	1.000	1.837	1.00	0.65	1.00	0.35			9.6	
MAY 11 70	MON		2.348	3.6	0.7	0.00	1.00	0.000	2.348	2.27	3.13	1.00	1.33	22.0	8.8	21.2	
MAY 12 70	TUE	6	2.392	3.7	0.7	0.00	1.00	0.000	2.392	0.00	0.65	1.00	0.27	23.0	0.0	11.8	0.0
MAY 13 70	WED		2.402	3.6	0.7	0.00	1.00	0.000	2.402	1.00	1.00	1.00	1.00	22.0			
MAY 14 70	THU		2.373	3.7	0.7	0.50	0.50	1.186	1.186	3.40	2.50	2.87	2.11		17.8	14.3	
MAY 15 70	FRI		2.244	3.5	0.7	0.50	0.50	1.122	1.122	3.40	2.50	3.03	2.23		17.5	14.0	
MAY 16 70	SAT		2.046	3.3	0.8	0.50	0.50	1.023	1.023	3.40	2.50	3.32	2.44		17.1	13.7	
MAY 17 70	SUN	6	1.920	2.9	0.8	0.50	0.50	0.960	0.960	3.40	2.50	3.54	2.60		16.9	13.4	12.1
MAY 18 70	MON		2.334	3.7	0.8	0.50	0.50	1.167	1.167	3.40	2.50	2.91	2.14	23.0	17.7	14.2	
MAY 19 70	TUE		2.265	3.5	0.8	0.50	0.50	1.132	1.132	3.40	2.50	3.00	2.21	23.0	17.6	14.1	
MAY 20 70	WED	6	2.207	3.4	0.7	0.50	0.50	1.103	1.103	3.40	2.50	3.08	2.27	22.0	17.5	14.0	22.0
MAY 21 70	THU	6	2.222	3.3	0.7	0.50	0.50	1.111	1.111	3.40	2.50	3.06	2.25	24.0	17.5	14.0	33.8
MAY 22 70	FRI		2.155	3.4	0.8	0.50	0.50	1.077	1.077	3.40	2.50	3.16	2.32	22.0	17.4	13.9	
MAY 23 70	SAT		1.794	2.9	0.7	0.50	0.50	0.897	0.897	3.40	2.50	3.79	2.79		16.7	13.2	
MAY 24 70	SUN	6	1.705	2.5	0.7	0.50	0.50	0.852	0.852	3.40	2.50	3.99	2.93		16.5	13.0	10.7
MAY 25 70	MON		2.134	3.3	0.9	0.50	0.50	1.067	1.067	3.40	2.50	3.19	2.34	22.0	17.3	13.8	

Date of Obsv	Day of Week	Samp Type	Total Flow	Max Flow	Min Flow	FRCT Side 1	FRCT Side 2	Flow Side 1	Flow Side 2	RCRC Side 1	RCRC Side 2	RCRC Ratio 1	RCRC Ratio 2	Temp	HYD Load 1	HYD Load 2	BOD Load 1
MAY 26 70	TUE	6	2.116	3.3	0.8	0.50	0.50	1.058	1.058	3.40	2.50	3.21	2.36	23.5	17.3	13.8	
MAY 27 70	WED		1.887	3.2	0.7	0.50	0.50	0.943	0.943	3.40	2.50	3.60	2.65	23.0	16.8	13.3	
MAY 28 70	THU	6	1.766	2.9	0.6	0.50	0.50	0.883	0.883	3.40	2.50	3.85	2.83	23.0	16.6	13.1	
MAY 29 70	FRI		1.713	2.8	0.6	0.50	0.50	0.856	0.856	3.40	2.50	3.97	2.92	23.0	16.5	13.0	
MAY 30 70	SAT		1.550	2.4	0.6	0.50	0.50	0.775	0.775	3.40	2.50	4.39	3.23		16.2	12.7	
MAY 31 70	SUN	6	1.492	2.2	0.7	0.50	0.50	0.746	0.746	3.40	2.50	4.56	3.35		16.1	12.6	7.0
JUN 1 70	MON		1.882	3.1	0.7	0.50	0.50	0.941	0.941	3.40	2.50	3.61	2.66		16.8	13.3	
JUN 2 70	TUE	6	1.765	2.8	0.6	0.50	0.50	0.882	0.882	3.40	2.50	3.85	2.83	23.0	16.6	13.1	18.5
JUN 3 70	WED		2.745	2.9	0.7	0.50	0.50	1.372	1.372	3.40	2.50	2.48	1.82	23.0	18.5	15.0	
JUN 4 70	THU	6	1.780	2.7	0.7	0.50	0.50	0.890	0.890	3.40	2.50	3.82	2.81	23.0	16.6	13.1	23.4
JUN 5 70	FRI		1.886	2.9	0.8	0.50	0.50	0.943	0.943	3.40	2.50	3.61	2.65	24.0	16.8	13.3	
JUN 6 70	SAT		1.676	2.6	0.7	0.50	0.50	0.838	0.838	3.40	2.50	4.06	2.98		16.4	12.9	
JUN 7 70	SUN	6	1.497	2.4	0.7	0.50	0.50	0.748	0.748	3.40	2.50	4.54	3.34		16.1	12.6	6.3
JUN 8 70	MON		1.956	3.1	0.6	0.50	0.50	0.978	0.978	3.40	2.50	3.48	2.56	23.0	17.0	13.5	
JUN 9 70	TUE	6	1.952	3.1	0.7	0.50	0.50	0.976	0.976	3.40	2.50	3.48	2.56	24.0	17.0	13.5	6.1
JUN 10 70	WED	9	2.032	3.1	0.8	0.50	0.50	1.016	1.016	3.40	2.50	3.35	2.46	24.0	17.1	13.6	
JUN 11 70	THU	9	1.988	3.4	0.7	0.50	0.50	0.994	0.994	3.40	2.50	3.42	2.52	24.0	17.0	13.5	17.7
JUN 12 70	FRI		1.892	3.0	0.6	0.50	0.50	0.946	0.946	3.40	2.50	3.59	2.64	25.0	16.8	13.4	
JUN 13 70	SAT		1.607	2.6	0.7	0.50	0.50	0.803	0.803	3.40	2.50	4.23	3.11		16.3	12.8	
JUN 14 70	SUN	6	1.496	2.3	0.6	0.50	0.50	0.748	0.748	3.40	2.50	4.55	3.34		16.1	12.6	8.6
JUN 15 70	MON	6	1.968	3.2	0.7	0.50	0.50	0.984	0.984	3.40	2.50	3.46	2.54	24.0	17.0	13.5	
JUN 16 70	TUE	6	1.993	3.1	0.7	0.50	0.50	0.996	0.996	3.40	2.50	3.41	2.51	24.0	17.0	13.6	23.5
JUN 17 70	WED	6	1.989	3.1	0.8	0.50	0.50	0.994	0.994	3.40	2.50	3.42	2.51	25.0	17.0	13.5	
JUN 18 70	THU	6	1.949	3.1	0.7	0.50	0.50	0.974	0.974	3.40	2.50	3.49	2.57	25.0	17.0	13.5	24.6
JUN 19 70	FRI		1.880	3.2	0.7	0.50	0.50	0.940	0.940	3.40	2.50	3.62	2.66	25.0	16.8	13.3	
JUN 20 70	SAT		1.658	2.6	0.7	0.50	0.50	0.829	0.829	3.40	2.50	4.10	3.02		16.4	12.9	
JUN 21 70	SUN	6	1.507	2.2	0.7	0.50	0.50	0.753	0.753	3.40	2.50	4.51	3.32		16.1	12.6	22.2
JUN 22 70	MON	6	1.973	3.0	0.7	0.50	0.50	0.986	0.986	3.40	2.50	3.45	2.53	26.0	17.0	13.5	
JUN 23 70	TUE	6	1.951	3.2	0.7	0.50	0.50	0.975	0.975	3.40	2.50	3.49	2.56	26.0	17.0	13.5	22.5
JUN 24 70	WED	6	1.931	3.1	0.7	0.50	0.50	0.965	0.965	3.40	2.50	3.52	2.59	26.0	16.9	13.4	
JUN 25 70	THU	6	2.405	4.3	1.1	0.50	0.50	1.202	1.202	3.40	2.50	2.83	2.08	25.0	17.8	14.4	30.3
JUN 26 70	FRI		2.052	3.2	0.8	0.50	0.50	1.026	1.026	3.40	2.50	3.31	2.44	25.5	17.2	13.7	
JUN 27 70	SAT		1.651	2.7	0.7	0.50	0.50	0.825	0.825	3.40	2.50	4.12	3.03		16.4	12.9	
JUN 28 70	SUN	6	1.471	2.2	0.6	0.50	0.50	0.735	0.735	3.80	3.50	5.17	4.76		17.6	16.4	15.8
JUN 29 70	MON		1.940	3.2	0.7	0.50	0.50	0.970	0.970	3.80	3.50	3.92	3.61	25.0	18.5	17.3	
JUN 30 70	TUE	6	1.977	3.1	0.7	0.50	0.50	0.988	0.988	3.80	3.50	3.84	3.54		18.6	17.4	25.9
JUL 1 70	WED	6	2.002	3.1	0.7	0.50	0.50	1.001	1.001	3.80	3.50	3.80	3.50	25.0	18.6	17.4	
JUL 2 70	THU	6	1.918	2.9	0.7	0.50	0.50	0.959	0.959	3.80	3.50	3.96	3.65	26.0	18.4	17.3	19.6
JUL 3 70	FRI		1.829	3.2	0.7	0.50	0.50	0.914	0.914	3.80	3.50	4.16	3.83	25.0	18.3	17.1	
JUL 4 70	SAT		1.563	2.4	0.7	0.50	0.50	0.781	0.781	3.80	3.50	4.86	4.48	26.0	17.8	16.6	
JUL 5 70	SUN	6	1.472	2.1	0.6	0.50	0.50	0.736	0.736	3.80	3.50	5.16	4.76		17.6	16.4	15.1
JUL 6 70	MON	6	1.808	2.8	0.7	0.50	0.50	0.904	0.904	3.80	3.50	4.20	3.87	26.0	18.2	17.1	
JUL 7 70	TUE	6	1.925	3.1	0.7	0.50	0.50	0.962	0.962	3.80	3.50	3.95	3.64	26.0	18.5	17.3	
JUL 8 70	WED	6	1.905	2.9	0.7	0.50	0.50	0.952	0.952	3.80	3.50	3.99	3.67	26.0	18.4	17.3	
JUL 9 70	THU	6	1.919	2.9	0.7	0.50	0.50	0.959	0.959	3.80	3.50	3.96	3.65	25.0	18.4	17.3	25.2
JUL 10 70	FRI		2.175	3.9	0.9	0.50	0.50	1.087	1.087	3.80	3.50	3.49	3.22	26.0	18.9	17.8	
JUL 11 70	SAT		1.743	2.7	0.8	0.50	0.50	0.871	0.871	3.80	3.50	4.36	4.02	26.0	18.1	16.9	
JUL 12 70	SUN	6	1.589	2.3	0.7	0.50	0.50	0.794	0.794	3.80	3.50	4.78	4.41		17.8	16.6	20.9
JUL 13 70	MON	6	1.973	3.1	0.8	0.50	0.50	0.986	0.986	3.80	3.50	3.85	3.55	26.0	18.6	17.4	
JUL 14 70	TUE	6	1.901	2.9	0.7	0.50	0.50	0.950	0.950	3.80	3.50	4.00	3.68	27.0	18.4	17.3	
JUL 15 70	WED		1.874	2.7	0.8	0.50	0.50	0.937	0.937	3.80	3.50	4.06	3.74	27.0	18.4	17.2	
JUL 16 70	THU		1.777	2.7	0.6	0.50	0.50	0.888	0.888	3.80	3.50	4.28	3.94	27.0	18.2	17.0	
JUL 17 70	FRI		1.615	2.7	0.7	0.50	0.50	0.807	0.807	3.40	2.90	4.21	3.59	27.0	16.3	14.4	

Date of Obsv	Day of Week	Samp Type	Total Flow	Max Flow	Min Flow	FRCT Side 1	FRCT Side 2	Flow Side 1	Flow Side 2	RCRC Side 1	RCRC Side 2	RCRC Ratio 1	RCRC Ratio 2	Temp	HYD Load 1	HYD Load 2	BOD Load 1
JUL 18 70	SAT		1.409	2.2	0.7	0.50	0.50	0.704	0.704	3.40	2.90	4.83	4.12		15.9	14.0	
JUL 19 70	SUN	6	1.382	1.9	0.6	0.50	0.50	0.691	0.691	3.40	2.90	4.92	4.20		15.9	13.9	
JUL 20 70	MON	6	2.077	3.8	0.7	0.50	0.50	1.038	1.038	3.40	2.90	3.27	2.79	26.0	17.2	15.3	
JUL 21 70	MON		1.911	2.8	0.8	0.50	0.50	0.955	0.955	3.40	2.60	3.56	2.72	27.0	16.9	13.8	
JUL 22 70	TUE		1.985	2.9	0.8	0.67	0.33	1.330	0.655	3.40	2.90	2.56	4.43	27.0	18.3	13.8	
JUL 23 70	THU	6	2.003	2.9	0.8	0.67	0.33	1.342	0.661	3.80	2.60	2.83	3.93	26.0	19.9	12.6	
JUL 24 70	THU		1.900	3.0	0.8	0.67	0.33	1.273	0.627	3.80	2.70	2.99	4.31	26.0	19.7	12.9	
JUL 25 70	FRI		1.715	2.5	0.7	0.67	0.33	1.149	0.566	3.80	2.70	3.31	4.77	26.0	19.2	12.7	
JUL 26 70	SUN	6	1.517	2.3	0.6	0.67	0.33	1.016	0.501	3.80	2.70	3.74	5.39		18.7	12.4	16.9
JUL 27 70	MON	6	1.995	3.2	0.8	0.67	0.33	1.337	0.658	3.80	2.70	2.84	4.10	27.0	19.9	13.0	
JUL 28 70	TUE	6	1.982	3.0	0.7	0.67	0.33	1.328	0.654	3.80	2.70	2.86	4.13		19.9	13.0	
JUL 29 70	WED		1.927	3.0	0.7	0.67	0.33	1.291	0.636	3.80	1.00	2.94	1.00		19.7		
JUL 30 70	THU		1.919	2.9	0.7	0.67	0.33	1.286	0.633	3.80	2.70	2.96	4.26		19.7	12.9	
JUL 31 70	FRI		1.882	2.9	0.6	0.67	0.33	1.261	0.621	3.80	2.70	3.01	4.35		19.6	12.9	
AUG 1 70	SAT		1.589	2.4	0.7	0.67	0.33	1.065	0.524	1.00	1.00	1.00	1.00				
AUG 2 70	SUN		1.492	2.2	0.7	0.67	0.33	1.000	0.492	1.00	1.00	1.00	1.00				
AUG 3 70	MON		1.920	3.1	0.7	0.67	0.33	1.286	0.634	1.00	1.00	1.00	1.00				
AUG 4 70	TUE		1.845	3.2	0.7	0.67	0.33	1.236	0.609	1.00	1.00	1.00	1.00				
AUG 5 70	WED	6	1.848	3.1	0.7	0.67	0.33	1.238	0.610	3.85	2.70	3.11	4.43		19.7	12.8	
AUG 6 70	THU	6	2.957	3.2	0.7	0.67	0.33	1.981	0.976	3.85	2.70	1.94	2.77		22.6	14.2	41.6
AUG 7 70	FRI		1.842	2.4	0.7	0.67	0.33	1.234	0.608	1.00	1.00	1.00	1.00				
AUG 8 70	SAT		1.568	3.0	0.7	0.67	0.33	1.051	0.517	1.00	1.00	1.00	1.00				
AUG 9 70	SUN	6	1.788	2.0	0.7	0.67	0.33	1.198	0.590	3.85	2.70	3.21	4.58	25.0	19.6	12.8	64.2
AUG 10 70	MON	6	2.667	3.5	1.3	0.67	0.33	1.787	0.880	3.85	2.70	2.15	3.07	25.0	21.8	13.9	
AUG 11 70	TUE		2.174	3.2	0.8	0.67	0.33	1.457	0.717	1.00	1.00	1.00	1.00	25.0			
AUG 12 70	WED	6	1.964	2.8	0.8	0.67	0.33	1.316	0.648	3.85	2.70	2.93	4.17	25.5	20.0	13.0	
AUG 13 70	THU	6	1.899	2.8	0.7	0.67	0.33	1.272	0.627	3.85	2.70	3.03	4.31	26.0	19.9	12.9	30.7
AUG 14 70	FRI		1.895	1.0	1.0	0.67	0.33	1.270	0.625	3.85	2.70	3.03	4.32	26.0	19.8	12.9	
AUG 16 70	SUN	6	1.000	1.0	1.0	1.00	1.00	1.000	1.000	1.00	1.00	1.00	1.00				
AUG 17 70	MON	6	1.000	1.0	1.0	1.00	1.00	1.000	1.000	1.00	1.00	1.00	1.00				
AUG 18 70	TUE	11	1.750	3.4	0.6	0.67	0.33	1.172	0.577	3.75	2.55	3.20	4.42		19.1	12.1	49.2
AUG 19 70	WED		2.913	3.3	0.8	0.67	0.33	1.952	0.961	3.80	2.55	1.95	2.65	26.5	22.3	13.6	
AUG 20 70	THU	6	1.990	3.3	0.9	0.67	0.33	1.333	0.657	3.80	2.55	2.85	3.88	26.5	19.9	12.4	43.9
AUG 21 70	FRI		1.887	3.3	0.8	0.67	0.33	1.264	0.623	3.75	2.55	2.97	4.10	27.0	19.4	12.3	
AUG 23 70	SUN		1.927	3.7	1.3	0.67	0.33	1.291	0.636	3.80	2.55	2.94	4.01		19.7	12.3	
AUG 24 70	MON	6	1.971	3.2	0.8	0.67	0.33	1.321	0.650	3.80	2.55	2.88	3.92	26.5	19.8	12.4	
AUG 25 70	TUE	6	1.804	2.8	0.8	0.67	0.33	1.209	0.595	3.80	2.55	3.14	4.28	27.0	19.4	12.2	20.3
AUG 26 70	WED	6	1.722	2.6	0.8	0.67	0.33	1.154	0.568	3.80	2.55	3.29	4.49	27.0	19.2	12.1	
AUG 27 70	THU	6	1.694	2.8	0.7	0.67	0.33	1.135	0.559	3.80	2.55	3.35	4.56	27.0	19.1	12.1	22.6
AUG 28 70	FRI		1.671	2.7	0.8	0.67	0.33	1.120	0.551	3.80	2.55	3.39	4.62	27.0	19.1	12.0	
AUG 29 70	SAT		1.498	2.5	0.7	0.67	0.33	1.004	0.494	3.80	2.55	3.79	5.16	27.0	18.6	11.8	
AUG 30 70	SUN	6	1.399	2.5	0.7	0.67	0.33	0.937	0.462	3.80	2.55	4.05	5.52	27.0	18.4	11.7	31.5
AUG 31 70	MON	6	1.779	2.7	0.8	0.67	0.33	1.192	0.587	3.80	2.55	3.19	4.34	26.5	19.3	12.2	
SEP 1 70	TUE	6	1.742	2.7	0.7	0.50	0.50	0.871	0.871	3.80	2.60	4.36	2.99	27.0	18.1	13.5	20.1
SEP 2 70	WED	6	1.718	2.8	0.7	0.50	0.50	0.859	0.859	1.60	2.60	1.86	3.03	27.0	9.5	13.4	
SEP 3 70	THU	6	1.738	2.9	0.6	0.50	0.50	0.869	0.869	1.00	2.60	1.00	2.99	27.0		13.4	26.9
SEP 6 70	SUN		1.000	2.8	0.6	0.50	0.50	1.000	1.000	2.90	3.00	1.00	1.00	27.0			
SEP 7 70	MON	6	1.451	2.5	0.6	0.50	0.50	0.725	0.725	1.60	0.90	2.21	1.24	27.0	9.0	6.3	
SEP 8 70	TUE	6	1.734	2.8	0.6	0.50	0.50	0.867	0.867	1.60	0.90	1.85	1.04	27.0	9.6	6.8	20.0
SEP 8 70	TUE	10	1.734	2.8	0.6	0.50	0.50	0.867	0.867	1.60	0.90	1.85	1.04	27.0	9.6	6.8	
SEP 9 70	WED		1.812	2.8	0.7	0.50	0.50	0.906	0.906	1.60	0.90	1.77	0.99	27.0	9.7	7.0	
SEP 10 70	THU	6	1.808	2.9	0.7	0.50	0.50	0.904	0.904	1.60	0.90	1.77	1.00	27.0	9.7	7.0	22.8
SEP 10 70	THU	10	1.808	2.9	0.7	0.50	0.50	0.904	0.904	1.60	0.90	1.77	1.00	27.0	9.7	7.0	

Date of Obsv	Day of Week	Samp Type	Total Flow	Max Flow	Min Flow	PRCT Side 1	PRCT Side 2	Flow Side 1	Flow Side 2	RCRC Side 1	RCRC Side 2	RCRC Ratio 1	PCRC Ratio 2	Temp	HYD Load 1	HYD Load 2	BOD Load 1
SEP 11 70	FRI		1.979	3.1	0.7	0.50	0.50	0.989	0.989	1.60	0.90	1.62	0.91	27.0	10.0	7.3	
SEP 12 70	SAT		2.031	3.6	0.7	0.50	0.50	1.015	1.015	1.60	0.90	1.58	0.89	27.0	10.1	7.4	
SEP 13 70	SUN	6	1.907	3.2	0.7	0.50	0.50	0.953	0.953	1.60	0.90	1.68	0.94	27.0	9.9	7.2	18.5
SEP 13 70	SUN	12	1.907	3.2	0.7	0.50	0.50	0.953	0.953	1.60	0.90	1.68	0.94	27.0	9.9	7.2	
SEP 14 70	MON	6	2.264	3.7	0.7	0.50	0.50	1.132	1.132	1.60	0.90	1.41	0.80	27.0	10.6	7.9	
SEP 15 70	TUE	6	2.320	3.7	0.7	0.50	0.50	1.160	1.160	1.60	0.90	1.38	0.78	27.5	10.7	8.0	27.4
SEP 15 70	TUE	12	2.320	3.7	0.7	0.50	0.50	1.160	1.160	1.60	0.90	1.38	0.78	27.5	10.7	8.0	
SEP 16 70	WED	6	2.391	3.7	0.7	0.50	0.50	1.195	1.195	1.60	0.90	1.34	0.75	27.5	10.8	8.1	
SEP 17 70	THU	12	2.498	3.6	0.7	0.50	0.50	1.249	1.249	1.60	0.90	1.28	0.72	27.5	11.0	8.3	
SEP 17 70	THU	6	2.498	3.6	0.7	0.50	0.50	1.249	1.249	1.60	0.90	1.28	0.72	27.5	11.0	8.3	38.7
SEP 18 70	FRI		2.447	3.7	0.7	0.50	0.50	1.223	1.223	3.80	2.70	3.11	2.21	28.0	19.5	15.2	
SEP 19 70	SAT		2.287	4.4	0.7	0.50	0.50	1.143	1.143	3.80	2.70	3.32	2.36	28.0	19.2	14.9	
SEP 20 70	SUN	6	2.106	3.4	0.7	0.50	0.50	1.053	1.053	1.60	0.90	1.52	0.85	27.5	10.3	7.6	20.5
SEP 20 70	SUN	12	2.106	3.4	0.7	0.50	0.50	1.053	1.053	1.60	0.90	1.52	0.85	27.5	10.3	7.6	
SEP 21 70	MON	6	2.542	3.7	0.7	0.50	0.50	1.271	1.271	1.60	0.90	1.26	0.71	28.0	11.1	8.4	
SEP 22 70	TUE	6	2.583	3.8	0.8	0.50	0.50	1.291	1.291	1.60	0.90	1.24	0.70	28.0	11.2	8.5	31.9
SEP 22 70	TUE	12	2.583	3.8	0.8	0.50	0.50	1.291	1.291	1.60	0.90	1.24	0.70	28.0	11.2	8.5	
SEP 23 70	WED	6	2.560	3.8	0.8	0.50	0.50	1.280	1.280	1.60	0.90	1.25	0.70	28.0	11.2	8.4	
SEP 24 70	THU	12	2.530	3.7	0.8	0.50	0.50	1.265	1.265	1.60	0.90	1.26	0.71	28.0	11.1	8.4	
SEP 24 70	THU	6	2.530	3.7	0.8	0.50	0.50	1.265	1.265	1.60	0.90	1.26	0.71	28.0	11.1	8.4	27.2
SEP 25 70	FRI		2.428	3.8	0.8	0.50	0.50	1.214	1.214	3.80	2.70	3.13	2.22	28.0	19.4	15.2	
SEP 26 70	SAT		2.075	3.5	0.7	0.50	0.50	1.037	1.037	3.80	2.70	3.66	2.60	28.0	18.7	14.5	
SEP 27 70	SUN	6	2.118	3.0	0.6	0.50	0.50	1.059	1.059	1.60	0.90	1.51	0.85	27.5	10.3	7.6	26.1
SEP 27 70	SUN	12	2.118	3.0	0.6	0.50	0.50	1.059	1.059	1.60	0.90	1.51	0.85	27.5	10.3	7.6	
SEP 28 70	MON	6	2.497	3.7	0.7	0.50	0.50	1.248	1.248	1.60	0.90	1.28	0.72	27.0	11.0	8.3	
SEP 29 70	TUE	6	2.455	3.7	0.7	0.50	0.50	1.227	1.227	1.60	0.90	1.30	0.73	26.0	11.0	8.2	30.9
SEP 29 70	TUE	12	2.455	3.7	0.7	0.50	0.50	1.227	1.227	1.60	0.90	1.30	0.73	26.0	11.0	8.2	
SEP 30 70	WED	6	2.440	3.6	0.7	0.50	0.50	1.220	1.220	1.60	0.90	1.31	0.74	26.0	10.9	8.2	
OCT 1 70	THU	12	2.484	3.6	0.8	0.33	0.67	0.820	1.664	3.90	3.40	4.76	2.04	26.0	18.3	19.6	
OCT 1 70	THU	6	2.484	3.6	0.8	0.33	0.67	0.820	1.664	3.90	3.40	4.76	2.04	26.0	18.3	19.6	19.8
OCT 2 70	FRI		2.309	3.7	0.7	0.33	0.67	0.762	1.547	3.90	3.40	5.12	2.20	26.0	18.1	19.2	
OCT 3 70	SAT		1.944	3.2	0.7	0.33	0.67	0.642	1.302	3.90	3.40	6.08	2.61	26.0	17.6	18.2	
OCT 4 70	SUN	4	1.704	2.6	0.6	0.33	0.67	0.562	1.142	3.90	3.40	6.94	2.98	25.0	17.3	17.6	
OCT 4 70	SUN	13	1.704	2.6	0.6	0.33	0.67	0.562	1.142	3.90	3.40	6.94	2.98	25.0	17.3	17.6	14.8
OCT 5 70	MON	6	2.341	3.4	0.7	0.33	0.67	0.773	1.568	3.90	3.40	5.05	2.17	25.0	18.1	19.3	
OCT 6 70	TUE	6	2.416	3.6	0.7	0.00	1.00	0.000	2.416	1.00	3.40	1.00	1.41	25.0		22.5	0.0
OCT 6 70	TUE	4	2.416	3.6	0.7	1.00	0.67	1.000	1.619	1.00	3.40	1.00	2.10	25.0		19.5	
OCT 8 70	THU		1.925	3.9	0.6	0.33	0.67	0.635	1.290	3.90	3.40	6.14	2.64		17.6	18.2	
OCT 7 70	WED		2.237	3.6	0.6	0.33	0.67	0.738	1.499	3.90	3.40	5.28	2.27	25.0	18.0	19.0	
OCT 9 70	FRI		2.399	3.5	0.7	0.33	0.67	0.792	1.607	3.80	2.80	4.80	1.74		17.8	17.1	
OCT 10 70	SAT		3.696	4.6	0.6	0.33	0.67	1.220	2.476	3.80	2.80	3.12	1.13		19.5	20.5	
OCT 11 70	SUN		2.063	3.4	0.7	0.33	0.67	0.681	1.382	3.80	2.80	5.58	2.03		17.4	16.2	
OCT 12 70	MON		2.594	3.6	0.8	0.33	0.67	0.856	1.738	3.80	2.90	4.44	1.67		18.0	18.0	
OCT 13 70	TUE		2.508	3.6	0.7	0.33	0.67	0.828	1.680	3.80	2.90	4.59	1.73		17.9	17.8	
OCT 14 70	WED		2.455	3.6	0.7	0.33	0.67	0.810	1.645	3.80	2.90	4.69	1.76		17.9	17.6	
OCT 15 70	THU		2.527	3.6	0.7	0.33	0.67	0.834	1.693	3.80	2.90	4.56	1.71		18.0	17.8	
OCT 16 70	FRI		2.308	3.7	0.7	0.33	0.67	0.762	1.546	3.80	2.90	4.99	1.88		17.7	17.2	
OCT 17 70	SAT		1.894	3.3	0.7	0.33	0.67	0.625	1.269	3.80	2.90	6.08	2.29	24.0	17.2	16.2	
OCT 18 70	SUN	6	1.844	2.8	0.7	0.33	0.67	0.609	1.235	3.80	2.90	6.24	2.35	23.0	17.1	16.0	12.8
OCT 18 70	SUN	12	1.000	1.0	1.0	1.00	1.00	1.000	1.000	1.00	1.00	1.00	1.00				
OCT 19 70	MON	6	2.414	3.6	0.7	0.33	0.67	0.797	1.617	3.80	2.90	4.77	1.79	24.0	17.8	17.5	
OCT 20 70	TUE	12	1.000	1.0	1.0	1.00	1.00	1.000	1.000	1.00	1.00	1.00	1.00				
OCT 20 70	TUE	6	2.458	3.6	0.8	0.33	0.67	0.811	1.647	3.80	2.90	4.68	1.76	24.0	17.9	17.6	18.3

Date of Obsv	Day of Week	Samp Type	Total Flow	Max Flow	Min Flow	FRCT Side 1	FRCT Side 2	Flow Side 1	Flow Side 2	RCRC Side 1	RCRC Side 2	RCPC Ratio 1	RCRC Ratio 2	Temp	HYD Load 1	HYD Load 2	BOD Load 1
--- -- --	---	--	-.---	-.-	-.-	-.--	-.--	-.---	-.---	-.--	-.--	-.--	-.--	--.-	--.-	--.-	--.-
OCT 21 70	WED	6	2.845	4.2	0.8	0.33	0.67	0.939	1.906	3.80	2.90	4.05	1.52	24.0	18.4	18.6	
OCT 22 70	THU	6	2.484	3.6	0.8	0.33	0.67	0.820	1.664	3.80	2.90	4.64	1.74	23.0	17.9	17.7	18.9
OCT 22 70	THU	12	1.000	1.0	1.0	1.00	1.00	1.000	1.000	1.00	1.00	1.00	1.00				
OCT 23 70	FRI		2.350	3.5	0.8	0.33	0.67	0.775	1.574	3.80	2.90	4.90	1.84	24.0	17.7	17.3	
OCT 24 70	SAT		1.987	3.3	0.7	0.33	0.67	0.656	1.331	3.80	2.90	5.80	2.18	25.0	17.3	16.4	
OCT 25 70	SUN	13	1.995	2.9	0.7	0.33	0.67	0.658	1.337	3.80	2.90	5.77	2.17	23.0	17.3	16.4	14.5
OCT 25 70	SUN	12	1.000	1.0	1.0	1.00	1.00	1.000	1.000	1.00	1.00	1.00	1.00				
OCT 26 70	MON	6	2.441	4.2	0.7	0.33	0.67	0.806	1.635	3.80	2.90	4.72	1.77	23.0	17.9	17.6	
OCT 27 70	TUE	6	2.432	3.7	0.7	0.33	0.67	0.803	1.629	3.80	2.90	4.73	1.78	21.0	17.8	17.6	21.1
OCT 27 70	TUE	12	1.000	1.0	1.0	1.00	1.00	1.000	1.000	1.00	1.00	1.00	1.00				
OCT 28 70	WED	6	2.370	3.6	0.7	0.33	0.67	0.782	1.588	3.80	2.90	4.86	1.83	21.0	17.8	17.4	
OCT 29 70	THU	6	2.401	3.6	0.8	0.33	0.67	0.792	1.609	3.80	2.90	4.80	1.80	21.0	17.8	17.5	25.8
OCT 29 70	THU	12	1.000	1.0	1.0	1.00	1.00	1.000	1.000	1.00	1.00	1.00	1.00				
OCT 30 70	FRI		3.558	4.6	2.2	0.33	0.67	1.174	2.384	3.80	2.90	3.24	1.22	22.0	19.3	20.5	
OCT 31 70	SAT		3.076	5.0	1.7	0.33	0.67	1.015	2.061	3.80	2.90	3.74	1.41	21.0	18.7	19.2	
NOV 1 70	SUN	6	2.742	4.2	1.0	0.33	0.67	0.905	1.837	3.80	2.90	4.20	1.58	21.0	18.2	18.4	18.5
NOV 1 70	SUN	10	1.000	1.0	1.0	1.00	1.00	1.000	1.000	1.00	1.00	1.00	1.00				
NOV 2 70	MON	6	2.827	4.2	1.0	0.33	0.67	0.933	1.894	3.80	2.90	4.07	1.53	21.5	18.3	18.6	
NOV 3 70	TUE		2.706	4.0	0.9	0.33	0.67	0.893	1.813	3.80	2.90	4.26	1.60	23.0	18.2	18.3	
NOV 4 70	WED		2.588	3.6	0.8	0.33	0.67	0.854	1.734	3.80	2.90	4.45	1.67	22.0	18.0	18.0	
NOV 5 70	THU	6	2.363	3.6	0.7	0.33	0.67	0.780	1.583	3.80	2.90	4.87	1.83	22.0	17.8	17.4	20.9
NOV 5 70	THU	10	1.000	1.0	1.0	1.00	1.00	1.000	1.000	1.00	1.00	1.00	1.00				
NOV 6 70	FRI		2.296	3.4	0.8	0.33	0.67	0.758	1.538	3.80	2.90	5.02	1.89	21.5	17.7	17.2	
NOV 7 70	SAT		2.163	4.1	0.7	0.33	0.67	0.714	1.449	3.80	2.90	5.32	2.00	22.0	17.5	16.9	
NOV 8 70	SUN	6	2.042	3.1	0.7	0.33	0.67	0.674	1.368	3.80	2.90	5.64	2.12	21.0	17.3	16.5	19.5
NOV 8 70	SUN	10	1.000	1.0	1.0	1.00	1.00	1.000	1.000	1.00	1.00	1.00	1.00				
NOV 9 70	MON	6	2.391	3.6	0.7	0.33	0.67	0.789	1.602	3.80	2.90	4.82	1.81	21.0	17.8	17.4	
NOV 10 70	TUE	6	2.867	3.7	1.1	0.33	0.67	0.946	1.921	3.80	2.90	4.02	1.51	22.0	18.4	18.7	21.4
NOV 10 70	TUE	10	1.000	1.0	1.0	1.00	1.00	1.000	1.000	1.00	1.00	1.00	1.00				
NOV 11 70	WED	6	2.995	4.2	1.0	0.33	0.67	0.988	2.007	3.80	2.90	3.84	1.45	21.5	18.6	19.0	
NOV 12 70	THU		2.531	3.6	0.8	0.33	0.67	0.835	1.696	3.80	2.90	4.55	1.71	21.0	18.0	17.8	
NOV 13 70	FRI		2.370	3.5	0.9	0.33	0.67	0.782	1.588	3.80	2.90	4.86	1.83	21.0	17.8	17.4	
NOV 14 70	SAT		2.252	3.0	1.1	0.33	0.67	0.743	1.509	3.80	2.90	5.11	1.92	20.5	17.6	17.1	
NOV 15 70	SUN		2.281	3.1	0.9	0.33	0.67	0.753	1.528	3.80	2.90	5.05	1.90	21.0	17.6	17.2	
NOV 16 70	MON		2.431	3.4	0.7	0.33	0.67	0.802	1.629	3.80	2.90	4.74	1.78	20.0	17.8	17.6	
NOV 17 70	TUE		2.190	3.3	0.7	0.33	0.67	0.723	1.467	3.80	2.90	5.26	1.98	20.0	17.5	16.9	
NOV 18 70	WED		2.365	3.3	0.7	0.33	0.67	0.780	1.585	3.80	2.90	4.87	1.83	20.0	17.8	17.4	
NOV 19 70	THU		2.549	3.5	0.8	0.33	0.67	0.841	1.708	3.80	2.90	4.52	1.70	20.0	18.0	17.9	
NOV 20 70	FRI		2.528	3.5	0.7	0.33	0.67	0.834	1.694	3.80	2.90	4.56	1.71	20.5	18.0	17.8	
NOV 21 70	SAT		2.330	3.9	0.8	0.33	0.67	0.769	1.561	3.80	2.90	4.94	1.86	20.0	17.7	17.3	
NOV 22 70	SUN		2.126	3.2	0.7	0.33	0.67	0.702	1.424	3.80	2.90	5.42	2.04	19.0	17.4	16.8	
NOV 23 70	MON		2.450	3.5	0.7	0.33	0.67	0.808	1.641	3.80	2.90	4.70	1.77		17.9	17.6	
NOV 24 70	TUE	6	2.214	3.3	0.8	0.33	0.67	0.731	1.483	3.80	2.90	5.20	1.95		17.6	17.0	
NOV 25 70	THU		1.796	3.2	0.6	0.33	0.67	0.593	1.203	3.80	2.90	6.41	2.41	18.0	17.0	15.9	
NOV 26 70	THU		1.310	2.4	0.7	0.33	0.67	0.432	0.878	3.80	2.90	8.79	3.30	18.0	16.4	14.6	
NOV 27 70	FRI		1.472	2.5	0.7	0.33	0.67	0.486	0.986	3.80	2.90	7.82	2.94	17.0	16.6	15.1	
NOV 28 70	SAT		1.386	2.3	0.7	0.33	0.67	0.457	0.929	3.80	2.90	8.31	3.12	18.0	16.5	14.8	
NOV 29 70	SUN	6	1.593	2.5	0.7	0.33	0.67	0.526	1.067	3.80	2.90	7.23	2.72	18.5	16.8	15.4	14.1
NOV 30 70	MON	6	2.445	3.2	0.7	0.33	0.67	0.807	1.638	3.80	2.90	4.71	1.77	19.0	17.9	17.6	
DEC 1 70	TUE	6	2.441	3.3	0.8	0.33	0.67	0.806	1.635	3.80	2.93	4.72	1.79	19.0	17.9	17.7	20.7
DEC 1 70	TUE	12	1.000	1.0	1.0	1.00	1.00	1.000	1.000	1.00	1.00	1.00	1.00				
DEC 2 70	WED	6	2.421	3.4	0.8	0.33	0.67	0.799	1.622	3.80	2.93	4.76	1.81	19.0	17.8	17.6	
DEC 3 70	THU	6	2.500	3.4	0.8	0.33	0.67	0.825	1.675	3.80	2.93	4.61	1.75	19.5	17.9	17.8	19.1

Date of Obsv	Day of Week	Samp Type	Total Flow	Max Flow	Min Flow	FRCT Side 1	FRCT Side 2	Flow Side 1	Flow Side 2	RCRC Side 1	RCRC Side 2	RCRC Ratio 1	RCRC Ratio 2	Temp	HYD Load 1	HYD Load 2	BOD Load 1
DEC 3 70	THU	12	1.000	1.0	1.0	1.00	1.00	1.000	1.000	1.00	1.00	1.00	1.00				
DEC 4 70	FRI	99	2.405	3.5	0.8	0.20	0.80	0.481	1.924	2.25	0.00	4.68	0.00	20.0	10.6	7.5	
DEC 5 70	SAT	99	2.113	3.2	0.8	0.20	0.80	0.423	1.690	2.25	1.85	5.32	1.09	19.0	10.4	13.7	
DEC 6 70	SUN	6	2.038	3.1	0.8	0.20	0.80	0.408	1.630	2.25	1.85	5.52	1.13	19.5	10.3	13.5	10.9
DEC 6 70	SUN	12	1.000	1.0	1.0	1.00	1.00	1.000	1.000	1.00	1.00	1.00	1.00				
DEC 7 70	MON	99	2.386	3.2	0.8	0.20	0.80	0.477	1.909	2.25	0.00	4.72	0.00	18.0	10.6	7.4	
DEC 8 70	TUE	6	2.434	3.4	0.8	0.20	0.80	0.487	1.947	2.25	0.00	4.62	0.00	18.0	10.6	7.5	14.1
DEC 8 70	TUE	12	1.000	1.0	1.0	1.00	1.00	1.000	1.000	1.00	1.00	1.00	1.00				
DEC 9 70	WED	6	2.448	3.3	0.8	0.20	0.80	0.490	1.958	2.25	0.00	4.60	0.00	18.0	10.6	7.6	
DEC 10 70	THU	6	2.446	3.9	0.8	0.20	0.80	0.489	1.957	2.25	0.00	4.60	0.00	18.0	10.6	7.6	14.9
DEC 10 70	THU	12	1.000	1.0	1.0	1.00	1.00	1.000	1.000	1.00	1.00	1.00	1.00				
DEC 11 70	FRI	99	2.414	3.5	0.9	0.20	0.80	0.483	1.931	2.25	0.00	4.66	0.00	17.0	10.6	7.5	
DEC 12 70	SAT	99	2.164	3.3	0.8	0.20	0.80	0.433	1.731	2.25	0.00	5.20	0.00	19.0	10.4	6.7	
DEC 13 70	SUN	6	1.994	3.0	0.8	0.20	0.80	0.399	1.595	2.25	0.00	5.64	0.00	18.5	10.3	6.2	9.4
DEC 14 70	MON	6	2.453	3.5	0.9	0.20	0.80	0.491	1.962	2.25	0.00	4.59	0.00	18.0	10.6	7.6	
DEC 15 70	TUE	6	2.437	3.5	0.8	0.20	0.80	0.487	1.950	2.25	0.00	4.62	0.00	18.0	10.6	7.6	13.1
DEC 16 70	WED	11	3.266	4.4	1.2	0.20	0.80	0.653	2.613	2.25	0.00	3.44	0.00	18.0	11.3	10.1	
DEC 17 70	THU	6	2.740	3.6	1.0	0.20	0.80	0.548	2.192	2.25	0.00	4.11	0.00	18.0	10.8	8.5	
DEC 20 70	SUN	6	1.550	2.3	0.9	0.20	0.80	0.310	1.240	2.25	0.00	7.26	0.00	17.0	9.9	4.8	
DEC 21 70	MON	6	1.994	3.1	0.9	0.20	0.80	0.399	1.595	2.25	0.00	5.64	0.00	16.0	10.3	6.2	
DEC 22 70	TUE	99	1.828	3.0	0.9	0.20	0.80	0.366	1.462	2.25	2.75	6.15	1.88	17.0	10.1	16.3	
DEC 23 70	WED	99	2.348	3.3	1.2	0.20	0.80	0.470	1.878	2.25	2.75	4.79	1.46	17.5	10.5	17.9	
DEC 24 70	THU	99	2.066	2.9	1.0	0.20	0.80	0.413	1.653	2.25	2.75	5.45	1.66	16.0	10.3	17.1	
DEC 25 70	FRI	99	1.155	2.0	0.9	0.20	0.80	0.231	0.924	2.25	2.75	9.74	2.98	16.0	9.6	14.2	
DEC 26 70	SAT	99	1.404	2.1	1.0	0.20	0.80	0.281	1.123	2.25	2.75	8.01	2.45	15.0	9.8	15.0	
DEC 27 70	SUN	6	1.387	2.0	0.9	0.20	0.80	0.277	1.110	2.25	2.75	8.11	2.48	15.0	9.8	15.0	
DEC 28 70	MON	6	1.669	2.6	0.9	0.20	0.80	0.334	1.335	2.25	2.75	6.74	2.06	14.5	10.0	15.8	
DEC 29 70	TUE	6	1.640	2.5	0.9	0.20	0.80	0.328	1.312	2.25	2.75	6.86	2.10	14.5	10.0	15.7	8.1
DEC 30 70	WED	6	1.588	2.3	0.9	0.20	0.80	0.318	1.270	2.25	2.75	7.08	2.16	14.5	10.0	15.6	
DEC 31 70	THU	99	1.961	2.4	1.0	0.20	0.80	0.392	1.569	2.25	2.75	5.74	1.75	13.5	10.2	16.7	
JAN 1 71	FRI	99	1.728	3.0	1.1	0.20	0.80	0.346	1.382	2.25	1.30	6.51	0.94	13.5	10.1	10.4	
JAN 2 71	SAT	99	1.826	2.5	1.0	0.20	0.80	0.365	1.461	2.25	1.30	6.16	0.89	14.0	10.1	10.7	
JAN 3 71	SUN	6	1.922	2.5	1.1	0.20	0.80	0.384	1.538	2.25	1.30	5.85	0.85	14.0	10.2	11.0	8.3
JAN 4 71	MON	6	2.680	5.5	1.2	0.20	0.80	0.536	2.144	2.25	1.30	4.20	0.61	15.5	10.8	13.3	
JAN 5 71	TUE	6	2.493	4.5	0.8	0.20	0.80	0.499	1.994	2.25	1.30	4.51	0.65	15.0	10.7	12.8	6.0
JAN 6 71	WED	6	1.752	4.2	0.8	0.20	0.80	0.350	1.402	2.25	1.30	6.42	0.93	15.0	10.1	10.5	
JAN 7 71	THU	6	1.927	4.0	0.7	0.20	0.80	0.385	1.542	2.25	1.30	5.84	0.84	16.0	10.2	11.0	6.9
JAN 8 71	FRI	99	1.827	4.0	1.8	0.20	0.80	0.365	1.462	2.25	1.30	6.16	0.89	15.0	10.1	10.7	
JAN 9 71	SAT	99	2.765	4.0	0.8	0.20	0.80	0.553	2.212	2.25	1.30	4.07	0.59	15.0	10.9	13.6	
JAN 10 71	SUN	6	2.348	4.0	1.2	0.20	0.80	0.470	1.878	2.25	1.30	4.79	0.69	15.0	10.5	12.3	8.6
JAN 11 71	MON	6	2.757	4.2	1.0	0.20	0.80	0.551	2.206	2.25	1.30	4.08	0.59	14.0	10.9	13.6	
JAN 12 71	TUE	6	2.803	4.4	0.9	0.20	0.80	0.561	2.242	2.25	1.30	4.01	0.58	15.0	10.9	13.7	10.3
JAN 13 71	WED	6	2.678	4.0	0.8	0.20	0.80	0.536	2.142	2.25	1.30	4.20	0.61	15.0	10.8	13.3	
JAN 14 71	THU	6	2.653	3.8	1.0	0.20	0.80	0.531	2.122	2.25	2.55	4.24	1.20	15.0	10.8	18.1	13.6
JAN 15 71	FRI	99	2.588	4.0	0.9	0.20	0.80	0.518	2.070	2.25	2.55	4.35	1.23	16.0	10.7	17.9	
JAN 16 71	SAT	99	2.333	3.8	0.9	0.20	0.80	0.467	1.866	2.25	2.55	4.82	1.37	14.0	10.5	17.1	
JAN 17 71	SUN	6	2.168	3.4	1.0	0.20	0.80	0.434	1.734	2.25	2.55	5.19	1.47	15.0	10.4	16.6	10.9
JAN 18 71	MON	6	2.559	3.7	1.0	0.67	0.33	1.715	0.844	4.00	1.30	2.33	1.54	15.0	22.1	8.3	
JAN 19 71	TUE	6	2.456	3.6	1.0	0.33	0.67	0.810	1.646	0.70	3.60	0.86	2.19	15.0	5.9	20.3	20.4
JAN 20 71	WED	6	2.415	3.6	1.0	0.33	0.67	0.797	1.618	0.70	3.60	0.88	2.22	14.0	5.8	20.2	
JAN 21 71	THU	6	2.422	3.8	1.0	0.33	0.67	0.799	1.623	0.70	1.30	0.88	0.80	13.5	5.8	11.3	26.0
JAN 22 71	FRI	99	2.407	3.6	1.0	0.33	0.67	0.794	1.613	0.70	2.25	0.88	1.40	15.0	5.8	15.0	
JAN 23 71	SAT	99	2.289	3.5	1.0	0.33	0.67	0.755	1.534	0.70	2.25	0.93	1.47	15.5	5.6	14.7	

Date of Obsv	Day of Week	Samp Type	Total Flow	Max Flow	Min Flow	FRCT Side 1	FRCT Side 2	Flow Side 1	Flow Side 2	BCRC Side 1	RCRC Side 2	RCRC Ratio 1	RCRC Ratio 2	Temp	HYD Load 1	HYD Load 2	BOD Load 1
JAN 24 71	SUN	6	2.271	3.3	1.1	0.33	0.67	0.749	1.522	0.70	2.25	0.93	1.48	15.0	5.6	14.6	21.6
JAN 25 71	MON	6	2.561	3.8	1.1	0.33	0.67	0.845	1.716	0.70	3.00	0.83	1.75	15.0	6.0	18.3	
JAN 26 71	TUE	6	2.381	3.4	1.0	0.33	0.67	0.786	1.595	0.70	3.00	0.89	1.88	15.0	5.8	17.8	15.3
JAN 27 71	WED	6	2.182	3.5	1.0	0.33	0.67	0.720	1.462	0.70	3.00	0.97	2.05	14.0	5.5	17.3	
JAN 28 71	THU	6	2.077	3.5	1.0	0.33	0.67	0.685	1.392	0.70	3.00	1.02	2.16	13.0	5.4	17.0	15.5
JAN 29 71	FRI	99	1.997	3.4	0.9	0.33	0.67	0.659	1.338	0.70	3.00	1.06	2.24	13.0	5.3	16.8	
JAN 30 71	SAT	99	1.895	2.9	0.9	0.33	0.67	0.625	1.270	0.70	3.00	1.12	2.36	14.0	5.1	16.5	
JAN 31 71	SUN	99	2.010	2.8	0.9	0.33	0.67	0.663	1.347	0.70	3.00	1.06	2.23	14.0	5.3	16.8	
FEB 1 71	MON	6	1.987	3.5	0.8	0.33	0.67	0.656	1.331	0.70	3.00	1.07	2.25	13.5	5.3	16.8	
FEB 2 71	TUE	6	3.735	2.8	0.9	0.33	0.67	1.233	2.502	0.70	3.60	0.57	1.44		7.5	23.7	29.8
FEB 3 71	WED	6	1.815	2.7	0.9	0.33	0.67	0.599	1.216	0.70	3.60	1.17	2.96		5.0	18.7	
FEB 4 71	THU	6	2.187	3.3	1.0	0.33	0.67	0.722	1.465	0.70	1.30	0.97	0.89	13.0	5.5	10.7	14.4
FEB 5 71	FRI	99	2.495	3.3	1.2	0.33	0.67	0.823	1.672	3.82	1.30	4.64	0.78	13.0	18.0	11.5	
FEB 6 71	SAT	99	2.052	3.0	1.0	0.33	0.67	0.677	1.375	3.82	1.30	5.64	0.95	13.0	17.4	10.4	
FEB 7 71	SUN	6	2.407	3.3	1.6	0.33	0.67	0.794	1.613	3.82	1.30	4.81	0.81	12.0	17.9	11.3	17.5
FEB 8 71	MON	6	2.746	3.5	1.4	0.33	0.67	0.906	1.840	0.70	1.30	0.77	0.71	11.0	6.2	12.2	
FEB 9 71	TUE	6	2.449	3.4	1.1	0.33	0.67	0.808	1.641	0.70	1.30	0.87	0.79	11.0	5.8	11.4	11.9
FEB 10 71	WED	6	2.279	3.3	1.1	0.33	0.67	0.752	1.527	0.70	1.30	0.93	0.85	10.0	5.6	11.0	
FEB 11 71	THU	6	2.102	3.2	1.1	0.33	0.67	0.694	1.408	0.70	1.30	1.01	0.92	11.0	5.4	10.5	19.3
FEB 12 71	FRI	99	2.002	3.0	1.2	0.33	0.67	0.661	1.341	0.70	1.30	1.06	0.97	11.0	5.3	10.2	
FEB 13 71	SAT	99	2.272	3.2	1.4	0.33	0.67	0.750	1.522	0.70	1.30	0.93	0.85	14.0	5.6	10.9	
FEB 14 71	SUN	6	2.079	2.9	1.1	0.33	0.67	0.686	1.393	0.70	1.30	1.02	0.93	11.0	5.4	10.4	17.6
FEB 15 71	MON	6	2.202	3.0	1.2	0.33	0.67	0.727	1.475	0.70	1.30	0.96	0.88	12.0	5.5	10.8	
FEB 16 71	TUE	6	2.124	3.0	1.2	0.50	0.50	1.062	1.062	2.85	2.85	2.68	2.68	13.0	15.2	15.2	29.0
FEB 17 71	WED	6	2.060	3.0	1.1	0.50	0.50	1.030	1.030	2.85	2.85	2.77	2.77	13.0	15.0	15.0	
FEB 18 71	THU	6	2.000	3.0	1.1	0.50	0.50	1.000	1.000	2.85	2.85	2.85	2.85	13.5	14.9	14.9	25.2
FEB 19 71	FRI	99	2.027	3.2	1.1	0.50	0.50	1.013	1.013	3.90	2.85	3.85	2.81	14.0	19.0	15.0	
FEB 20 71	SAT	99	1.682	2.9	0.6	0.50	0.50	0.841	0.841	3.90	2.85	4.64	3.39	15.0	18.4	14.3	
FEB 21 71	SUN	6	1.572	2.5	0.6	0.50	0.50	0.786	0.786	3.90	2.85	4.96	3.63	15.0	18.2	14.1	19.0
FEB 22 71	MON	6	2.229	3.2	0.9	0.50	0.50	1.114	1.114	3.90	2.85	3.50	2.56	16.0	19.4	15.4	
FEB 23 71	TUE	6	2.007	3.5	0.7	0.50	0.50	1.003	1.003	3.90	2.85	3.89	2.84	16.0	19.0	14.9	20.0
FEB 24 71	WED	6	1.911	2.8	0.6	0.50	0.50	0.955	0.955	3.90	2.85	4.08	2.98	15.0	18.8	14.7	
FEB 25 71	THU	6	1.970	3.1	0.6	0.50	0.50	0.985	0.985	3.90	2.85	3.96	2.89	15.0	18.9	14.9	24.8
FEB 26 71	FRI	99	1.823	3.0	0.7	0.50	0.50	0.911	0.911	3.90	2.85	4.28	3.13	15.0	18.6	14.6	
FEB 27 71	SAT	99	1.615	2.9	0.5	0.50	0.50	0.807	0.807	2.85	2.85	3.53	3.53	16.0	14.2	14.2	
FEB 28 71	SUN	6	1.546	2.6	0.6	0.50	0.50	0.773	0.773	2.85	2.85	3.69	3.69	15.0	14.0	14.0	20.3
MAR 1 71	MON	6	1.732	3.0	0.6	0.50	0.50	0.866	0.866	2.85	2.85	3.29	3.29	16.0	14.4	14.4	
MAR 2 71	TUE	6	2.382	3.5	1.5	0.50	0.50	1.191	1.191	2.85	2.85	2.39	2.39	16.5	15.7	15.7	23.1
MAR 3 71	WED	6	2.084	3.7	2.3	0.50	0.50	1.042	1.042	2.85	2.85	2.74	2.74	16.0	15.1	15.1	
MAR 4 71	THU	6	2.617	3.8	1.1	0.50	0.50	1.308	1.308	2.85	2.85	2.18	2.18	13.0	16.1	16.1	20.6
MAR 5 71	FRI	99	2.979	4.5	1.2	0.50	0.50	1.489	1.489	2.85	2.85	1.91	1.91	13.0	16.8	16.8	
MAR 6 71	SAT	99	2.675	3.9	1.0	0.50	0.50	1.337	1.337	2.85	2.85	2.13	2.13	14.0	16.2	16.2	
MAR 7 71	SUN	6	2.461	3.6	0.9	0.50	0.50	1.230	1.230	1.49	2.85	1.21	2.32	15.0	10.5	15.8	17.4
MAR 8 71	MON	6	2.876	4.1	0.9	0.50	0.50	1.438	1.438	2.85	2.85	1.98	1.98	14.5	16.6	16.6	
MAR 9 71	TUE	6	2.825	4.0	0.9	0.50	0.50	1.412	1.412	2.85	2.85	2.02	2.02	14.5	16.5	16.5	28.9
MAR 10 71	WED	6	2.773	4.0	0.9	0.50	0.50	1.386	1.386	2.85	2.85	2.06	2.06	15.0	16.4	16.4	
MAR 11 71	THU	6	2.833	4.2	0.7	0.50	0.50	1.416	1.416	2.85	2.85	2.01	2.01	15.0	16.5	16.5	40.9
MAR 12 71	FRI	99	2.584	4.1	0.7	0.50	0.50	1.292	1.292	2.85	2.85	2.21	2.21	15.0	16.1	16.1	
MAR 13 71	SAT	99	2.271	3.6	0.7	0.50	0.50	1.135	1.135	2.85	2.85	2.51	2.51	16.0	15.4	15.4	
MAR 14 71	SUN	6	2.150	3.1	0.8	0.50	0.50	1.075	1.075	2.85	2.85	2.65	2.65	16.0	15.2	15.2	22.0
MAR 15 71	MON	6	2.817	3.9	1.0	0.50	0.50	1.408	1.408	2.85	2.85	2.02	2.02	17.0	16.5	16.5	
MAR 16 71	TUE	6	2.286	4.0	0.7	0.50	0.50	1.143	1.143	2.85	2.85	2.49	2.49	17.0	15.5	15.5	25.2
MAR 17 71	WED	6	3.091	4.0	0.8	0.50	0.50	1.545	1.545	2.85	2.85	1.84	1.84	17.0	17.0	17.0	

Date of Obsv	Day of Week	Samp Type	Total Flow	Max Flow	Min Flow	FRCT Side 1	FRCT Side 2	Flow Side 1	Flow Side 2	RCRC Side 1	RCRC Side 2	RCRC Ratio 1	RCRC Ratio 2	Temp	HYD Load 1	HYD Load 2	BOD Load 1
MAR 18 71	THU	6	2.700	4.0	0.8	0.50	0.50	1.350	1.350	2.85	2.85	2.11	2.11	16.0	16.3	16.3	38.3
MAR 19 71	FRI	99	2.750	4.0	0.8	0.50	0.50	1.375	1.375	2.85	2.85	2.07	2.07	16.0	16.4	16.4	
MAR 20 71	SAT	99	2.445	3.6	0.7	0.50	0.50	1.222	1.222	2.85	2.85	2.33	2.33	16.0	15.8	15.8	
MAR 21 71	SUN	6	2.217	3.3	0.8	0.50	0.50	1.108	1.108	2.85	2.85	2.57	2.57	16.0	15.3	15.3	33.2
MAR 22 71	MON	6	2.694	3.9	0.8	0.50	0.50	1.347	1.347	2.85	2.85	2.12	2.12	16.0	16.3	16.3	
MAR 23 71	TUE	6	2.638	4.0	0.7	0.50	0.50	1.319	1.319	2.85	2.85	2.16	2.16	16.0	16.2	16.2	41.5
MAR 24 71	WED	6	2.593	3.8	0.7	0.50	0.50	1.296	1.296	2.85	2.85	2.20	2.20	16.0	16.1	16.1	
MAR 25 71	THU	6	2.628	3.9	0.8	0.50	0.50	1.314	1.314	2.85	2.85	2.17	2.17	15.0	16.1	16.1	42.8
MAR 26 71	FRI	99	2.334	3.5	0.7	0.50	0.50	1.167	1.167	2.85	2.85	2.44	2.44	15.5	15.6	15.6	
MAR 27 71	SAT	99	2.168	3.0	1.1	0.50	0.50	1.084	1.084	2.85	2.85	2.63	2.63	15.0	15.2	15.2	
MAR 28 71	SUN	6	1.926	3.8	0.8	0.50	0.50	0.963	0.963	2.85	2.85	2.96	2.96	14.0	14.8	14.8	
MAR 29 71	MON	6	2.817	3.8	1.4	0.50	0.50	1.408	1.408	2.85	2.85	2.02	2.02	14.5	16.5	16.5	
MAR 30 71	TUE	6	2.458	3.5	0.8	0.50	0.50	1.229	1.229	2.85	2.85	2.32	2.32	14.0	15.8	15.8	20.6
MAR 31 71	WED	6	2.216	3.1	0.8	0.50	0.50	1.108	1.108	2.85	2.85	2.57	2.57	14.0	15.3	15.3	
APR 1 71	THU	6	2.117	3.1	0.9	0.50	0.50	1.058	1.058	2.85	2.85	2.69	2.69	14.5	15.1	15.1	22.2
APR 2 71	FRI	99	2.147	3.1	0.7	0.50	0.50	1.073	1.073	2.85	2.85	2.65	2.65	15.0	15.2	15.2	
APR 3 71	SAT	99	1.921	9.7	0.8	0.50	0.50	0.960	0.960	2.85	2.85	2.97	2.97	14.5	14.8	14.8	
APR 4 71	SUN	6	2.015	2.8	0.8	0.50	0.50	1.007	1.007	2.85	2.85	2.83	2.83	15.0	15.0	15.0	
APR 5 71	MON	6	2.920	3.9	1.8	0.50	0.50	1.460	1.460	2.85	2.85	1.95	1.95	15.0	16.7	16.7	
APR 6 71	TUE	6	3.539	4.4	1.6	0.50	0.50	1.769	1.769	2.85	2.85	1.61	1.61	15.0	17.9	17.9	30.7
APR 7 71	WED	6	3.383	4.4	1.2	0.50	0.50	1.691	1.691	2.85	2.85	1.68	1.68	14.0	17.6	17.6	
APR 8 71	THU	6	3.082	4.2	1.1	0.50	0.50	1.541	1.541	3.80	0.65	2.47	0.42	15.0	20.7	8.5	32.4
APR 9 71	FRI	99	2.701	4.0	0.7	0.50	0.50	1.350	1.350	3.80	0.65	2.81	0.48	15.0	20.0	7.8	
APR 10 71	SAT	99	2.156	3.2	0.7	0.50	0.50	1.078	1.078	3.80	0.65	3.53	0.60	16.0	18.9	6.7	
APR 11 71	SUN	99	2.060	3.0	0.8	0.50	0.50	1.030	1.030	3.80	0.65	3.69	0.63	16.0	18.7	6.5	
APR 12 71	MON	6	2.594	3.7	0.9	0.50	0.50	1.297	1.297	3.80	0.65	2.93	0.50	17.0	19.8	7.5	
APR 13 71	TUE	6	2.770	3.9	0.9	0.50	0.50	1.385	1.385	3.80	0.65	2.74	0.47	17.5	20.1	7.9	37.1
APR 14 71	WED	6	2.668	3.9	0.9	0.50	0.50	1.334	1.334	3.80	0.65	2.85	0.49	18.0	19.9	7.7	
APR 15 71	THU	6	2.683	3.9	0.8	0.50	0.50	1.341	1.341	3.80	0.65	2.83	0.48	18.0	19.9	7.7	35.9
APR 16 71	FRI	99	2.628	4.1	0.8	0.50	0.50	1.314	1.314	3.80	0.65	2.89	0.49	18.0	19.8	7.6	
APR 17 71	SAT	99	2.212	3.4	0.7	0.50	0.50	1.106	1.106	3.80	0.65	3.44	0.59	18.0	19.0	6.8	
APR 18 71	SUN	6	2.074	3.0	0.7	0.50	0.50	1.037	1.037	3.80	0.65	3.66	0.63	18.5	18.7	6.5	29.4
APR 19 71	MON	6	2.522	3.7	0.8	0.50	0.50	1.261	1.261	3.80	0.65	3.01	0.52	19.0	19.6	7.4	
APR 20 71	TUE	6	2.573	3.9	0.8	0.50	0.50	1.286	1.286	3.80	0.65	2.95	0.51	19.0	19.7	7.5	29.0
APR 21 71	WED	6	2.653	3.8	0.8	0.50	0.50	1.326	1.326	3.80	0.65	2.86	0.49	20.0	19.9	7.7	
APR 22 71	THU	6	2.654	4.0	0.7	0.50	0.50	1.327	1.327	3.80	0.65	2.86	0.49	20.0	19.9	7.7	31.4
APR 23 71	FRI	99	2.498	3.8	0.7	0.50	0.50	1.249	1.249	3.80	0.65	3.04	0.52	19.5	19.6	7.4	
APR 24 71	SAT	99	2.096	3.1	0.7	0.50	0.50	1.048	1.048	3.80	0.65	3.63	0.62	19.0	18.8	6.6	
APR 25 71	SUN	6	1.985	2.9	0.6	0.50	0.50	0.992	0.992	3.80	0.65	3.83	0.65	19.0	18.6	6.4	25.5
APR 26 71	MON	6	2.492	3.5	0.7	0.50	0.50	1.246	1.246	3.80	0.65	3.05	0.52	19.5	19.6	7.3	
APR 27 71	TUE	6	2.614	3.5	1.2	0.50	0.50	1.307	1.307	3.80	0.65	2.91	0.50	20.0	19.8	7.6	32.9
APR 28 71	WED	6	2.830	3.5	0.8	0.50	0.50	1.415	1.415	3.80	0.65	2.69	0.46	19.0	20.2	8.0	
APR 29 71	THU	6	2.690	3.6	0.8	0.50	0.50	1.345	1.345	3.80	0.65	2.83	0.48	20.0	19.9	7.7	32.5
APR 30 71	FRI	99	2.583	3.6	0.7	0.50	0.50	1.291	1.291	3.80	0.65	2.94	0.50	20.0	19.7	7.5	
MAY 1 71	SAT	99	2.321	3.4	0.7	0.50	0.50	1.160	1.160	2.54	1.25	2.19	1.08	19.5	14.3	9.3	
MAY 2 71	SUN	6	2.054	3.2	0.7	0.50	0.50	1.027	1.027	2.54	1.25	2.47	1.22	19.5	13.8	8.8	23.7
MAY 3 71	MON	6	2.588	3.6	0.8	0.50	0.50	1.294	1.294	2.54	1.25	1.96	0.97	20.0	14.9	9.9	
MAY 4 71	TUE	6	2.510	3.6	0.8	0.50	0.50	1.255	1.255	2.54	1.25	2.02	1.00	20.0	14.7	9.7	34.3
MAY 5 71	WED	99	2.499	3.5	0.8	0.50	0.50	1.249	1.249	2.54	1.25	2.03	1.00	20.0	14.7	9.7	
MAY 6 71	THU	6	2.578	3.6	0.7	0.50	0.50	1.289	1.289	2.54	1.25	1.97	0.97	20.0	14.8	9.8	37.9
MAY 7 71	FRI	99	2.439	3.6	0.8	0.50	0.50	1.219	1.219	2.54	1.25	2.08	1.03	20.0	14.6	9.6	
MAY 8 71	SAT	99	1.990	3.0	0.7	0.50	0.50	0.995	0.995	2.54	1.25	2.55	1.26	21.0	13.7	8.7	
MAY 9 71	SUN	6	1.933	2.6	0.6	0.50	0.50	0.966	0.966	2.54	1.25	2.63	1.29	21.0	13.6	8.6	31.0

Date of Obsv	Day of Week	Samp Type	Total Flow	Max Flow	Min Flow	FRCT Side 1	FRCT Side 2	Flow Side 1	Flow Side 2	RCRC Side 1	RCRC Side 2	RCRC Ratio 1	RCRC Ratio 2	Temp	HYD Load 1	HYD Load 2	BOD Load 1
MAY 10 71	MON	99	2.514	3.5	0.7	0.00	1.00	0.000	2.514	0.00	1.25	1.00	0.50	21.0	0.0	14.6	
MAY 11 71	TUE	99	2.521	3.5	0.8	1.00	0.00	2.521	0.000	0.00	0.00	0.00	1.00	21.5	9.8	0.0	
MAY 12 71	WED	99	2.655	3.5	0.9	0.00	0.00	0.000	0.000	0.00	0.00	1.00	1.00	21.0	0.0	0.0	
MAY 13 71	THU	99	2.827	4.0	0.8	0.50	0.50	1.413	1.413	2.58	2.23	1.83	1.58	21.0	15.5	14.1	
MAY 14 71	FRI	99	2.489	3.7	0.8	0.50	0.50	1.244	1.244	2.58	2.23	2.07	1.79	22.0	14.8	13.5	
MAY 15 71	SAT	99	2.896	3.8	0.9	0.50	0.50	1.448	1.448	2.54	1.25	1.75	0.86	21.5	15.5	10.5	
MAY 16 71	SUN	6	3.250	3.7	1.5	0.50	0.50	1.625	1.625	2.54	1.25	1.56	0.77	21.5	16.1	11.1	44.4
MAY 17 71	MON	6	3.244	4.1	1.3	0.50	0.50	1.622	1.622	2.54	1.25	1.57	0.77	20.0	16.1	11.1	
MAY 18 71	TUE	6	2.867	3.8	1.0	0.50	0.50	1.433	1.433	2.54	1.25	1.77	0.87	21.0	15.4	10.4	21.1
MAY 19 71	WED	99	2.799	3.9	1.0	0.50	0.50	1.399	1.399	2.54	1.25	1.81	0.89	21.0	15.3	10.3	
MAY 20 71	THU	6	2.747	3.7	0.9	0.50	0.50	1.373	1.373	2.54	1.25	1.85	0.91	22.0	15.2	10.2	35.3
MAY 21 71	FRI	99	2.536	3.5	0.9	0.50	0.50	1.268	1.268	2.54	1.25	2.00	0.99	22.5	14.8	9.8	
MAY 22 71	SAT	99	2.139	3.2	0.8	0.50	0.50	1.069	1.069	2.54	1.25	2.37	1.17	22.0	14.0	9.0	
MAY 23 71	SUN	6	2.017	3.1	0.8	0.50	0.50	1.009	1.008	2.54	1.25	2.52	1.24	22.0	13.8	8.8	43.4
MAY 24 71	MON	6	2.468	3.6	0.8	0.50	0.50	1.234	1.234	2.54	1.25	2.06	1.01	22.0	14.6	9.6	
MAY 25 71	TUE	6	2.351	3.5	0.7	0.50	0.50	1.175	1.175	2.54	1.25	2.16	1.06	22.5	14.4	9.4	
MAY 26 71	WED	6	2.080	3.3	0.8	0.50	0.50	1.040	1.040	2.54	1.25	2.44	1.20	22.5	13.9	8.9	
MAY 27 71	THU	6	2.021	3.1	0.8	0.50	0.50	1.010	1.010	2.54	1.25	2.51	1.24	22.5	13.8	8.8	27.6
MAY 28 71	FRI	99	3.097	3.6	2.7	0.50	0.50	1.548	1.548	2.54	1.25	1.64	0.81	22.5	15.8	10.8	
MAY 29 71	SAT	99	2.674	3.1	1.3	0.50	0.50	1.337	1.337	2.54	1.25	1.90	0.93	20.0	15.0	10.0	
MAY 30 71	SUN	99	4.883	2.9	1.0	0.50	0.50	2.441	2.441	2.54	1.25	1.04	0.51	20.0	19.3	14.3	
MAY 31 71	MON	6	2.336	3.3	1.0	0.50	0.50	1.168	1.168	2.54	1.25	2.17	1.07	21.0	14.4	9.4	
JUN 1 71	TUE	6	2.139	3.1	0.8	0.50	0.50	1.069	1.069	2.54	3.40	2.37	3.18	21.0	14.0	17.3	23.0
JUN 2 71	WED	6	2.056	2.9	0.8	0.50	0.50	1.028	1.028	2.54	3.40	2.47	3.31	21.0	13.8	17.2	
JUN 3 71	THU	6	2.039	3.0	0.7	0.50	0.50	1.019	1.019	2.54	3.00	2.49	2.94	22.0	13.8	15.6	23.6
JUN 4 71	FRI	99	2.021	3.0	0.8	0.50	0.50	1.010	1.010	2.54	3.00	2.51	2.97	22.5	13.8	15.5	
JUN 5 71	SAT	99	1.789	2.7	0.9	0.50	0.50	0.894	0.894	2.54	3.00	2.84	3.35	22.0	13.3	15.1	
JUN 6 71	SUN	6	1.770	2.6	0.9	0.50	0.50	0.885	0.885	2.54	3.00	2.87	3.39	23.0	13.3	15.1	
JUN 7 71	MON	6	2.242	3.3	0.8	0.50	0.50	1.121	1.121	2.54	3.00	2.27	2.68	23.5	14.2	16.0	
JUN 8 71	TUE	6	2.206	3.4	0.7	0.50	0.50	1.103	1.103	2.54	3.00	2.30	2.72	24.0	14.1	15.9	35.9
JUN 9 71	WED	6	2.189	3.2	0.7	0.50	0.50	1.094	1.094	2.54	3.00	2.32	2.74	22.0	14.1	15.9	
JUN 10 71	THU	6	2.163	3.1	0.7	0.50	0.50	1.081	1.081	2.54	3.00	2.35	2.77	22.5	14.0	15.8	29.5
JUN 11 71	FRI	99	2.107	3.1	0.7	0.50	0.50	1.053	1.053	2.54	3.00	2.41	2.85	23.0	13.9	15.7	
JUN 12 71	SAT	99	1.805	2.7	0.7	0.50	0.50	0.902	0.902	2.54	3.00	2.81	3.32	24.0	13.3	15.1	
JUN 13 71	SUN	6	1.805	2.0	0.5	0.50	0.50	0.902	0.902	2.54	3.00	2.81	3.32	24.0	13.3	15.1	25.6
JUN 14 71	MON	6	1.503	2.5	0.6	0.50	0.50	0.751	0.751	2.54	3.00	3.38	3.99	24.0	12.8	14.5	
JUN 15 71	TUE	6	1.452	2.3	0.6	0.50	0.50	0.726	0.726	2.54	3.00	3.50	4.13	24.5	12.7	14.4	25.2
JUN 16 71	WED	6	1.033	2.0	0.6	0.50	0.50	0.516	0.516	2.54	3.00	4.92	5.81	24.5	11.8	13.6	
JUN 17 71	THU	99	1.453	2.4	0.6	0.50	0.50	0.726	0.726	2.54	3.00	3.50	4.13	24.5	12.7	14.4	
JUN 18 71	FRI	99	1.320	2.2	0.5	0.50	0.50	0.660	0.660	2.54	3.00	3.85	4.55	24.5	12.4	14.2	
JUN 19 71	SAT	99	1.067	2.0	0.5	0.50	0.50	0.533	0.533	2.54	3.00	4.76	5.62	24.0	11.9	13.7	
JUN 20 71	SUN	99	0.759	1.9	0.5	0.50	0.50	0.379	0.379	2.54	3.00	6.69	7.91	24.0	11.3	13.1	
JUN 21 71	MON	99	1.632	2.3	0.6	0.00	1.00	0.000	1.632	0.00	3.00	1.00	1.84	24.0	0.0	18.0	
JUN 22 71	TUE	6	1.599	2.4	0.6	0.50	0.50	0.799	0.799	2.54	3.00	3.18	3.75	25.0	12.9	14.7	20.1
JUN 23 71	WED	99	2.157	3.0	0.7	0.50	0.50	1.078	1.078	2.54	4.10	2.36	3.80	25.0	14.0	20.1	
JUN 24 71	THU	6	2.120	3.2	0.7	0.50	0.50	1.060	1.060	2.54	4.10	2.40	3.87	25.0	14.0	20.0	37.8
JUN 25 71	FRI	99	2.063	3.1	0.7	0.50	0.50	1.031	1.031	2.54	4.10	2.46	3.97	25.0	13.8	19.9	
JUN 26 71	SAT	6	1.792	2.8	0.7	0.50	0.50	0.896	0.896	2.54	4.10	2.83	4.58	25.5	13.3	19.4	16.9
JUN 27 71	SUN	99	1.328	3.7	0.7	0.50	0.50	0.664	0.664	2.54	4.10	3.83	6.17	25.5	12.4	18.5	
JUN 28 71	MON	6	1.367	2.5	0.5	0.50	0.50	0.683	0.683	2.54	4.10	3.72	6.00	25.5	12.5	18.5	
JUN 29 71	TUE	6	2.027	2.0	0.5	0.50	0.50	1.013	1.013	2.54	4.10	2.51	4.05	25.5	13.8	19.8	25.5
JUN 30 71	WED	6	2.196	3.2	0.7	0.50	0.50	1.098	1.098	2.54	4.10	2.31	3.73	25.5	14.1	20.1	
JUL 1 71	THU	6	2.290	3.2	0.8	0.50	0.50	1.145	1.145	2.54	4.10	2.22	3.58	25.5	14.3	20.3	

Date of Obsv	Day of Week	Samp Type	Total Flow	Max Flow	Min Flow	PRCT Side 1	PRCT Side 2	Flow Side 1	Flow Side 2	RCRC Side 1	RCRC Side 2	RCRC Ratio 1	RCRC Ratio 2	Temp	HYD Load 1	HYD Load 2	BOD Load 1
JUL 2 71	FRI	99	2.050	3.1	0.7	0.50	0.50	1.025	1.025	2.54	4.10	2.48	4.00	25.5	13.8	19.9	
JUL 3 71	SAT	99	1.717	2.5	0.6	0.50	0.50	0.858	0.858	2.54	4.10	2.96	4.78	26.0	13.2	19.2	
JUL 4 71	SUN	99	1.484	2.3	0.6	0.50	0.50	0.742	0.742	2.54	4.10	3.42	5.53	25.5	12.7	18.8	
JUL 5 71	MON	6	1.863	2.9	0.6	0.50	0.50	0.931	0.931	2.54	9.20	2.73	9.88	25.0	13.5	39.3	
JUL 6 71	TUE	6	2.258	3.5	0.7	0.50	0.50	1.129	1.129	2.93	4.20	2.60	3.72	26.0	15.7	20.7	22.5
JUL 7 71	WED	6	2.144	3.2	0.7	0.50	0.50	1.072	1.072	0.00	4.20	0.00	3.92	26.0	4.2	20.4	
JUL 8 71	THU	6	2.192	3.4	0.7	0.50	0.50	1.096	1.096	2.93	4.20	2.67	3.83	26.0	15.6	20.5	21.9
JUL 9 71	FRI	99	2.092	3.3	0.7	0.50	0.50	1.046	1.046	2.93	3.40	2.80	3.25	26.0	15.4	17.2	
JUL 10 71	SAT	6	1.763	2.6	0.7	0.50	0.50	0.881	0.861	2.93	3.40	3.32	3.86	26.0	14.8	16.6	20.4
JUL 11 71	SUN	99	1.697	2.5	0.7	0.50	0.50	0.848	0.848	2.93	3.40	3.45	4.01	26.0	14.6	16.5	
JUL 12 71	MON	6	2.078	3.0	0.6	0.50	0.50	1.039	1.039	4.00	3.40	3.85	3.27	26.0	19.5	17.2	
JUL 13 71	TUE	6	2.062	3.3	0.7	0.50	0.50	1.031	1.031	4.00	3.40	3.88	3.30	26.0	19.5	17.2	
JUL 14 71	WED	6	2.034	3.0	0.7	0.50	0.50	1.017	1.017	4.00	3.40	3.93	3.34	26.0	19.4	17.1	
JUL 15 71	THU	6	2.037	3.0	0.7	0.50	0.50	1.018	1.018	4.00	3.40	3.93	3.34	26.5	19.5	17.1	35.3
JUL 16 71	FRI	99	2.026	3.1	0.7	0.50	0.50	1.013	1.013	3.40	3.40	3.36	3.36	26.5	17.1	17.1	
JUL 17 71	SAT	6	1.711	2.6	0.7	0.50	0.50	0.855	0.855	3.40	3.40	3.97	3.97	26.5	16.5	16.5	25.2
JUL 18 71	SUN	99	1.595	2.4	0.6	0.50	0.50	0.797	0.797	3.40	3.40	4.26	4.26	26.5	16.3	16.3	
JUL 19 71	MON	6	2.043	3.0	0.7	0.50	0.50	1.021	1.021	3.40	3.40	3.33	3.33	27.0	17.1	17.1	
JUL 20 71	TUE	6	2.025	3.0	0.6	0.50	0.50	1.012	1.012	3.40	3.40	3.36	3.36	27.0	17.1	17.1	21.3
JUL 21 71	WED	6	2.035	3.3	0.6	0.50	0.50	1.017	1.017	3.40	3.40	3.34	3.34	27.0	17.1	17.1	
JUL 22 71	THU	6	2.030	3.0	0.7	0.50	0.50	1.015	1.015	3.40	3.40	3.35	3.35	27.0	17.1	17.1	27.2
JUL 23 71	FRI	99	1.891	3.0	0.7	0.50	0.50	0.945	0.945	3.40	3.40	3.60	3.60	26.5	16.8	16.8	
JUL 24 71	SAT	6	1.688	2.5	0.6	0.50	0.50	0.844	0.844	3.40	3.40	4.03	4.03	26.5	16.4	16.4	12.0
JUL 25 71	SUN	99	1.535	2.3	0.6	0.50	0.50	0.767	0.767	3.40	3.40	4.43	4.43	26.0	16.2	16.2	
JUL 26 71	MON	6	2.098	3.0	0.7	0.50	0.50	1.049	1.049	3.40	3.40	3.24	3.24	26.0	17.2	17.2	
JUL 27 71	TUE	6	2.010	4.0	0.8	0.50	0.50	1.005	1.005	3.40	3.40	3.38	3.38	26.5	17.1	17.1	20.0
JUL 28 71	WED	6	2.015	3.1	0.6	0.50	0.50	1.007	1.007	3.40	3.40	3.37	3.37	26.5	17.1	17.1	
JUL 29 71	THU	6	2.191	3.5	0.7	0.50	0.50	1.095	1.095	3.40	3.40	3.10	3.10	27.0	17.4	17.4	32.8
JUL 30 71	FRI	99	2.286	3.5	0.8	0.50	0.50	1.143	1.143	3.40	3.40	2.97	2.97	27.0	17.6	17.6	
JUL 31 71	SAT	99	2.226	4.5	0.8	0.50	0.50	1.113	1.113	3.40	3.40	3.05	3.05	26.0	17.5	17.5	
AUG 1 71	SUN	99	1.868	2.6	0.8	0.50	0.50	0.934	0.934	3.40	3.40	3.64	3.64	25.5	16.8	16.8	
AUG 2 71	MON	6	2.404	3.5	0.9	0.50	0.50	1.202	1.202	3.40	3.40	2.83	2.83	26.5	17.8	17.8	
AUG 3 71	TUE	6	2.348	3.6	0.9	0.50	0.50	1.174	1.174	3.40	3.40	2.90	2.90	27.0	17.7	17.7	23.4
AUG 4 71	WED	6	2.441	3.4	1.4	0.50	0.50	1.220	1.220	3.40	3.40	2.79	2.79	27.0	17.9	17.9	
AUG 5 71	THU	6	2.278	3.4	1.4	0.50	0.50	1.139	1.139	3.40	3.40	2.99	2.99	26.0	17.6	17.6	19.1
AUG 6 71	FRI	99	2.082	3.3	0.9	0.50	0.50	1.041	1.041	3.40	3.40	3.27	3.27	26.0	17.2	17.2	
AUG 7 71	SAT	99	1.775	3.3	0.8	0.50	0.50	0.887	0.887	3.40	3.40	3.83	3.83	27.0	16.6	16.6	
AUG 8 71	SUN	99	1.631	2.6	0.8	0.50	0.50	0.815	0.815	3.40	3.40	4.17	4.17	26.0	16.3	16.3	
AUG 9 71	MON	6	2.027	2.5	0.7	0.50	0.50	1.013	1.013	3.40	3.40	3.35	3.35	25.0	17.1	17.1	
AUG 10 71	TUE	6	1.655	3.1	0.6	0.50	0.50	0.827	0.827	3.40	3.40	4.11	4.11	25.0	16.4	16.4	21.3
AUG 11 71	WED	6	2.188	3.0	0.8	0.50	0.50	1.094	1.094	3.40	3.40	3.11	3.11	27.0	17.4	17.4	
AUG 12 71	THU	6	2.100	3.0	0.8	0.50	0.50	1.050	1.050	3.40	3.40	3.24	3.24	25.0	17.2	17.2	30.9
AUG 13 71	FRI	99	1.955	3.2	0.7	0.50	0.50	0.977	0.977	3.40	3.40	3.48	3.48	25.0	17.0	17.0	
AUG 14 71	SAT	6	1.781	2.6	0.8	0.50	0.50	0.890	0.890	3.40	3.40	3.82	3.82	26.0	16.6	16.6	15.0
AUG 15 71	SUN	99	1.607	2.5	0.7	0.50	0.50	0.803	0.803	3.40	3.40	4.23	4.23	25.0	16.3	16.3	
AUG 16 71	MON	6	2.001	3.0	0.7	0.50	0.50	1.000	1.000	3.40	3.40	3.40	3.40	24.0	17.1	17.1	
AUG 17 71	TUE	6	2.814	3.7	2.2	0.50	0.50	1.407	1.407	3.40	3.40	2.42	2.42	23.0	18.6	18.6	35.5
AUG 18 71	WED	6	2.555	4.0	0.9	0.50	0.50	1.277	1.277	3.40	3.40	2.66	2.66	24.0	18.1	18.1	
AUG 19 71	THU	6	2.167	3.4	0.8	0.50	0.50	1.083	1.083	3.40	3.40	3.14	3.14	23.0	17.4	17.4	27.3
AUG 20 71	FRI	99	2.010	3.1	0.8	0.50	0.50	1.005	1.005	3.40	3.40	3.38	3.38	26.0	17.1	17.1	
AUG 21 71	SAT	6	1.100	2.3	0.7	0.50	0.50	0.550	0.550	3.40	3.40	6.18	6.18	26.5	15.3	15.3	
AUG 22 71	SUN	99	1.889	3.6	1.3	0.50	0.50	0.944	0.944	3.40	3.40	3.60	3.60	26.5	16.8	16.8	
AUG 23 71	MON	6	2.157	3.3	0.7	0.50	0.50	1.078	1.078	3.40	3.40	3.15	3.15	25.5	17.4	17.4	

Date of Obsv	Day of Week	Samp Type	Total Flow	Max Flow	Min Flow	PRCT Side 1	PRCT Side 2	Flow Side 1	Flow Side 2	RCRC Side 1	RCRC Side 2	RCRC Ratio 1	RCRC Ratio 2	Temp	HYD Load 1	HYD Load 2	BOD Load 1
AUG 24 71	TUE	6	2.378	3.1	0.7	0.50	0.50	1.189	1.189	3.40	3.00	2.86	2.52	25.0	17.8	16.2	25.0
AUG 25 71	WED	6	0.662	1.0	1.0	0.50	0.50	0.331	0.331	3.40	3.00	0.27	9.06	26.0	14.5	12.9	
AUG 26 71	THU	6	1.089	3.1	1.0	0.50	0.50	0.544	0.544	3.40	3.40	6.24	6.24	26.5	15.3	15.3	14.6
AUG 27 71	FRI	99	0.409	1.0	1.0	0.50	0.50	0.204	0.204	3.40	3.30	6.63	6.14	26.5	14.0	13.6	
AUG 28 71	SAT	6	0.193	1.0	1.0	0.50	0.50	0.096	0.096	3.40	3.30	5.23	4.20	26.0	13.6	13.2	2.2
AUG 29 71	SUN	99	0.144	1.0	1.0	0.50	0.50	0.072	0.072	3.40	3.30	7.22	5.83	26.5	13.5	13.1	
AUG 30 71	MON	6	1.620	3.9	0.6	0.50	0.50	0.810	0.810	3.40	3.30	4.20	4.07	26.0	16.3	15.9	
AUG 31 71	TUE	6	0.980	1.0	1.0	0.50	0.50	0.490	0.490	3.40	3.30	6.94	6.73	26.5	15.1	14.7	13.6
SEP 1 71	WED	6	2.105	1.0	1.0	0.50	0.50	1.052	1.052	3.40	3.25	3.23	3.09	26.5	17.3	16.7	
SEP 2 71	THU	6	3.063	4.4	0.9	0.50	0.50	1.531	1.531	3.40	3.25	2.22	2.12	26.5	19.1	18.5	80.4
SEP 3 71	FRI	99	2.799	4.0	1.0	0.50	0.50	1.399	1.399	3.40	3.25	2.43	2.32	27.0	18.6	18.0	
SEP 4 71	SAT	99	2.553	4.1	0.9	0.50	0.50	1.276	1.276	3.40	2.40	2.66	1.88	27.0	18.1	14.2	
SEP 5 71	SUN	99	2.498	3.6	0.9	0.50	0.50	1.249	1.249	3.40	2.40	2.72	1.92	26.0	18.0	14.1	
SEP 6 71	MON	99	2.864	4.0	1.0	0.50	0.50	1.432	1.432	3.40	2.40	2.37	1.68	26.5	18.7	14.9	
SEP 7 71	TUE	6	2.984	4.8	0.9	0.50	0.50	1.492	1.492	3.40	2.40	2.28	1.61	26.5	19.0	15.1	52.5
SEP 8 71	WED	6	3.059	4.4	1.0	0.50	0.50	1.529	1.529	2.93	2.93	1.92	1.92	27.0	17.3	17.3	
SEP 9 71	THU	6	3.064	4.7	0.9	0.50	0.50	1.532	1.532	2.93	2.93	1.91	1.91	27.0	17.3	17.3	51.5
SEP 10 71	FRI	99	3.235	5.0	0.9	0.50	0.50	1.617	1.617	2.93	2.93	1.81	1.81	27.0	17.6	17.6	
SEP 11 71	SAT	6	3.184	4.5	0.9	0.50	0.50	1.592	1.592	2.93	2.93	1.84	1.84	27.0	17.5	17.5	40.1
SEP 12 71	SUN	99	4.224	6.5	2.0	0.50	0.50	2.112	2.112	2.93	2.93	1.39	1.39	25.0	19.5	19.5	
SEP 13 71	MON	6	3.757	5.1	1.6	0.50	0.50	1.878	1.878	2.93	2.93	1.56	1.56	25.0	18.6	18.6	
SEP 14 71	TUE	99	3.450	5.7	1.1	0.50	0.50	1.725	1.725	2.93	2.93	1.70	1.70	25.0	18.0	18.0	
SEP 15 71	WED	6	3.262	4.1	1.2	0.50	0.50	1.631	1.631	2.93	2.93	1.80	1.80	25.0	17.7	17.7	
SEP 16 71	THU	6	3.169	4.5	1.2	0.50	0.50	1.584	1.584	2.93	2.93	1.85	1.85	26.5	17.5	17.5	47.4
SEP 17 71	FRI	99	3.068	4.5	1.1	0.50	0.50	1.534	1.534	2.93	2.93	1.91	1.91	26.5	17.3	17.3	
SEP 18 71	SAT	6	2.631	4.1	1.0	0.50	0.50	1.315	1.315	2.93	2.93	2.23	2.23	26.0	16.5	16.5	30.4
SEP 19 71	SUN	99	2.539	3.6	1.0	0.50	0.50	1.269	1.269	2.93	2.93	2.31	2.31	26.0	16.3	16.3	
SEP 20 71	MON	6	3.121	4.5	1.0	0.50	0.50	1.560	1.560	2.93	2.93	1.88	1.88	26.0	17.4	17.4	
SEP 21 71	TUE	6	3.959	5.9	2.0	0.50	0.50	1.979	1.979	2.93	2.93	1.48	1.48	27.0	19.0	19.0	54.0
SEP 22 71	WED	6	3.592	4.9	1.1	0.50	0.50	1.796	1.796	2.93	2.03	1.63	1.13	24.5	18.3	14.8	
SEP 23 71	THU	6	3.455	4.9	1.2	0.50	0.50	1.727	1.727	2.93	2.03	1.70	1.18	25.0	18.1	14.6	55.3
SEP 24 71	FRI	99	3.290	4.5	1.0	0.50	0.50	1.645	1.645	2.93	2.03	1.78	1.23	25.0	17.7	14.2	
SEP 25 71	SAT	6	2.953	5.3	1.0	0.50	0.50	1.476	1.476	2.93	2.03	1.98	1.37	25.0	17.1	13.6	60.5
SEP 26 71	SUN	99	2.744	3.9	1.0	0.50	0.50	1.372	1.372	2.93	2.03	2.14	1.48	25.0	16.7	13.2	
SEP 27 71	MON	6	3.156	4.8	1.0	0.50	0.50	1.578	1.578	2.93	2.03	1.86	1.29	25.0	17.5	14.0	
SEP 28 71	TUE	99	3.147	4.9	1.0	0.50	0.50	1.573	1.573	2.93	2.03	1.86	1.29	25.0	17.5	14.0	
SEP 29 71	WED	99	3.007	4.6	0.9	0.50	0.50	1.503	1.503	2.93	2.03	1.95	1.35	27.0	17.2	13.7	
SEP 30 71	THU	6	3.392	4.8	1.0	0.50	0.50	1.696	1.696	2.93	2.03	1.73	1.20	25.0	17.9	14.4	49.0
OCT 1 71	FRI	99	4.822	5.6	1.2	0.50	0.50	2.411	2.411	2.93	2.00	1.22	0.83	24.0	20.7	17.1	
OCT 2 71	SAT	6	3.846	5.6	1.1	0.50	0.50	1.923	1.923	2.93	2.00	1.52	1.04	26.0	18.8	15.2	53.5
OCT 3 71	SUN	99	3.170	5.0	1.4	0.50	0.50	1.585	1.585	2.93	2.00	1.85	1.26	26.0	17.5	13.9	
OCT 4 71	MON	6	3.486	5.0	1.0	0.50	0.50	1.743	1.743	2.90	2.00	1.66	1.15	25.0	18.0	14.5	
OCT 5 71	TUE	6	3.962	5.0	3.3	0.50	0.50	1.981	1.981	2.93	2.00	1.48	1.01	26.0	19.0	15.4	55.1
OCT 6 71	WED	6	4.351	5.3	1.9	0.50	0.50	2.175	2.175	2.93	2.00	1.35	0.92	24.0	19.8	16.2	
OCT 7 71	THU	99	3.643	5.0	1.3	0.50	0.50	1.821	1.821	2.93	2.00	1.61	1.10	25.0	18.4	14.8	
OCT 8 71	FRI	99	3.359	4.9	1.0	0.50	0.50	1.679	1.679	2.93	2.00	1.74	1.19	23.0	17.9	14.3	
OCT 9 71	SAT	99	3.610	5.1	2.4	0.50	0.50	1.805	1.805	2.93	2.00	1.62	1.11	23.0	18.4	14.7	
OCT 10 71	SUN	6	4.222	5.0	2.4	0.50	0.50	2.111	2.111	2.93	2.00	1.39	0.95	22.0	19.5	15.9	26.6
OCT 11 71	MON	6	3.827	4.8	1.3	0.50	0.50	1.913	1.913	2.93	2.00	1.53	1.05	23.0	18.8	15.2	
OCT 12 71	TUE	6	3.621	4.2	1.4	0.50	0.50	1.810	1.810	2.93	2.00	1.62	1.10	22.0	18.4	14.8	55.1
OCT 13 71	WED	6	3.455	1.0	1.0	0.50	0.50	1.727	1.727	2.93	2.00	1.70	1.16	22.0	18.1	14.4	
OCT 14 71	THU	6	3.400	4.7	1.1	0.50	0.50	1.700	1.700	2.93	2.00	1.72	1.18	23.0	17.9	14.3	53.5
OCT 15 71	FRI	99	3.061	4.7	1.0	0.50	0.50	1.530	1.530	2.93	2.00	1.91	1.31	22.5	17.3	13.7	

Date of Obsv	Day of Week	Samp Type	Total Flow	Max Flow	Min Flow	FRCT Side 1	FRCT Side 2	Flow Side 1	Flow Side 2	RCRC Side 1	RCRC Side 2	RCRC Ratio 1	RCRC Ratio 2	Temp	HYD Load 1	HYD Load 2	BOD Load 1
OCT 16 71	SAT	6	2.687	3.2	1.0	0.50	0.50	1.343	1.343	2.93	2.00	2.18	1.49	24.0	16.6	13.0	21.9
OCT 17 71	SUN	99	2.555	3.4	0.9	0.50	0.50	1.277	1.277	2.93	2.00	2.29	1.57	23.0	16.3	12.7	
OCT 18 71	MON	6	3.173	4.5	1.0	0.50	0.50	1.586	1.586	2.93	2.00	1.85	1.26	23.0	17.5	13.9	
OCT 19 71	TUE	6	3.316	4.8	1.1	0.50	0.50	1.658	1.658	2.93	2.00	1.77	1.21	23.5	17.8	14.2	
OC" 20 71	WED	6	3.262	4.5	1.1	0.50	0.50	1.631	1.631	2.93	2.00	1.80	1.23	24.5	17.7	14.1	
OCT 21 71	THU	6	2.999	4.4	1.1	0.50	0.50	1.499	1.499	2.93	2.00	1.95	1.33	24.0	17.2	13.6	46.4
OCT 22 71	FRI	99	4.190	4.5	2.5	0.50	0.50	2.095	2.095	2.93	2.00	1.40	0.95	24.0	19.5	15.9	
OCT 23 71	SAT	6	4.292	5.5	2.3	0.50	0.50	2.146	2.146	2.93	2.00	1.37	0.93	24.0	19.7	16.1	39.4
OCT 24 71	SUN	99	4.870	5.0	4.6	0.50	0.50	2.435	2.435	2.93	2.00	1.20	0.82	23.0	20.8	17.2	
OCT 25 71	MON	99	4.400	6.0	2.5	0.50	0.50	2.200	2.200	2.93	0.00	1.33	0.00	23.0	19.9	8.5	
OCT 26 71	TUE	99	4.249	5.4	2.0	0.00	1.00	0.000	4.249	0.00	0.00	1.00	0.00	23.0	0.0	16.5	
OCT 27 71	WED	99	3.790	5.1	1.6	0.00	1.00	0.000	3.790	0.00	2.00	1.00	0.53	23.0	0.0	22.4	
OCT 28 71	THU	99	3.720	5.5	1.3	0.50	0.50	1.860	1.860	2.15	2.00	1.16	1.08	23.0	15.5	15.0	
OCT 29 71	FRI	99	3.382	4.9	1.2	0.50	0.50	1.691	1.691	2.93	2.93	1.73	1.73	23.5	17.9	17.9	
OCT 30 71	SAT	99	3.091	5.2	1.0	0.50	0.50	1.545	1.545	2.93	2.93	1.90	1.90	23.5	17.3	17.3	
OCT 31 71	SUN	99	2.909	4.3	1.1	0.50	0.50	1.454	1.454	2.93	2.47	2.01	1.70	24.0	17.0	15.2	
NOV 1 71	MON	6	3.399	5.0	1.0	0.50	0.50	1.699	1.699	2.94	2.56	1.73	1.51	24.0	18.0	16.5	
NOV 2 71	TUE	6	3.380	4.6	1.0	0.50	0.50	1.690	1.690	2.94	2.56	1.74	1.51	24.5	17.9	16.5	45.2
NOV 3 71	WED	6	3.649	5.0	0.9	0.50	0.50	1.824	1.824	2.94	2.56	1.61	1.40	25.0	18.5	17.0	
NOV 4 71	THU	99	3.358	4.6	1.0	0.50	0.50	1.679	1.679	2.94	2.56	1.75	1.52	24.5	17.9	16.4	
NOV 5 71	FRI	99	3.201	4.5	0.9	0.50	0.50	1.600	1.600	2.94	2.94	1.84	1.84	24.0	17.6	17.6	
NOV 6 71	SAT	99	3.012	5.1	0.9	0.50	0.50	1.506	1.506	2.94	2.94	1.95	1.95	23.0	17.2	17.2	
NOV 7 71	SUN	99	2.754	4.0	0.9	0.50	0.50	1.377	1.377	2.94	2.94	2.14	2.14	23.0	16.7	16.7	
NOV 8 71	MON	99	3.158	4.4	0.9	0.50	0.50	1.579	1.579	2.94	2.94	1.86	1.86	23.0	17.5	17.5	
NOV 9 71	TUE	99	3.053	4.5	0.9	0.50	0.50	1.526	1.526	2.94	2.94	1.93	1.93	22.0	17.3	17.3	
NOV 10 71	WED	6	2.943	4.2	0.9	0.50	0.50	1.471	1.471	2.94	2.94	2.00	2.00	22.0	17.1	17.1	
NOV 11 71	THU	6	3.109	4.3	0.9	0.50	0.50	1.554	1.554	2.94	2.94	1.89	1.89	21.5	17.4	17.4	44.9
NOV 12 71	FRI	99	2.869	4.5	0.9	0.50	0.50	1.434	1.434	2.94	2.94	2.05	2.05	21.5	17.0	17.0	
NOV 13 71	SAT	6	2.474	3.9	0.8	0.50	0.50	1.237	1.237	2.94	2.94	2.38	2.38	21.5	16.2	16.2	40.3
NOV 14 71	SUN	99	2.509	3.4	0.8	0.50	0.50	1.254	1.254	2.94	2.94	2.34	2.34	21.5	16.3	16.3	
NOV 15 71	MON	6	3.106	4.5	1.0	0.50	0.50	1.553	1.553	2.94	2.94	1.89	1.89	21.5	17.4	17.4	
NOV 16 71	TUE	6	3.032	4.5	0.8	0.50	0.50	1.516	1.516	2.94	2.94	1.94	1.94	22.0	17.3	17.3	47.0
NOV 17 71	WED	6	3.035	4.3	0.7	0.50	0.50	1.517	1.517	2.94	2.94	1.94	1.94	22.0	17.3	17.3	
NOV 18 71	THU	6	3.049	4.9	0.8	0.50	0.50	1.524	1.524	2.94	2.94	1.93	1.93	20.5	17.3	17.3	44.0
NOV 19 71	FRI	99	2.997	4.2	0.9	0.50	0.50	1.498	1.498	2.94	2.94	1.96	1.96	21.5	17.2	17.2	
NOV 20 71	SAT	6	2.639	4.4	0.8	0.50	0.50	1.319	1.319	2.94	2.94	2.23	2.23	22.0	16.5	16.5	
NOV 21 71	SUN	99	2.523	3.8	0.7	0.50	0.50	1.261	1.261	2.94	2.94	2.33	2.33	21.0	16.3	16.3	
NOV 22 71	MON	6	2.964	4.5	0.8	0.50	0.50	1.482	1.482	2.94	2.94	1.98	1.98	20.0	17.1	17.1	
NOV 23 71	TUE	6	2.854	4.3	0.8	0.50	0.50	1.427	1.427	2.94	2.94	2.06	2.06	20.5	16.9	16.9	
NOV 24 71	WED	99	2.359	4.0	1.4	0.50	0.50	1.179	1.179	2.94	2.94	2.49	2.49	21.0	16.0	16.0	
NOV 25 71	THU	99	2.020	3.3	0.9	0.50	0.50	1.010	1.010	2.94	2.94	2.91	2.91	19.0	15.3	15.3	
NOV 26 71	FRI	99	2.167	3.3	0.9	0.50	0.50	1.083	1.083	2.94	2.94	2.71	2.71	18.5	15.6	15.6	
NOV 27 71	SAT	6	2.572	3.8	1.0	0.50	0.50	1.286	1.286	2.94	2.94	2.29	2.29	19.0	16.4	16.4	39.2
NOV 28 71	SUN	99	2.532	3.3	1.1	0.50	0.50	1.266	1.266	2.94	2.94	2.32	2.32	18.0	16.3	16.3	
NOV 29 71	MON	6	3.260	4.4	1.1	0.50	0.50	1.630	1.630	2.94	2.94	1.80	1.80	19.0	17.7	17.7	
NOV 30 71	TUE	15	3.183	4.3	0.9	0.50	0.50	1.591	1.591	2.94	2.94	1.85	1.85	19.5	17.6	17.6	
DEC 1 71	WED	15	3.103	4.0	1.0	0.50	0.50	1.551	1.551	2.94	2.94	1.89	1.89	19.0	17.4	17.4	
DEC 2 71	THU	15	3.065	4.1	0.9	0.50	0.50	1.532	1.532	2.94	2.94	1.92	1.92	19.0	17.3	17.3	48.3
DEC 3 71	FRI	99	3.072	4.0	1.0	0.50	0.50	1.536	1.536	2.94	2.94	1.91	1.91	18.5	17.3	17.3	
DEC 4 71	SAT	15	2.950	4.0	1.0	0.50	0.50	1.475	1.475	2.94	2.94	1.99	1.99	18.0	17.1	17.1	45.7
DEC 5 71	SUN	99	2.786	3.8	1.0	0.50	0.50	1.393	1.393	2.94	2.94	2.11	2.11	18.0	16.8	16.8	
DEC 6 71	MON	15	3.146	4.1	0.9	0.50	0.50	1.573	1.573	2.94	2.94	1.87	1.87	19.0	17.5	17.5	
DEC 7 71	TUE	15	3.315	4.0	1.0	0.50	0.50	1.657	1.657	2.94	2.94	1.77	1.77	19.0	17.8	17.8	44.4

Date of Obsv	Day of Week	Samp Type	Total Flow	Max Flow	Min Flow	FRCT Side 1	FRCT Side 2	Flow Side 1	Flow Side 2	RCRC Side 1	RCRC Side 2	RCRC Ratio 1	RCRC Ratio 2	Temp	HYD Load 1	HYD Load 2	BOD Load 1
DEC 8 71	WED	15	3.227	4.0	1.2	0.50	0.50	1.613	1.613	2.94	2.94	1.82	1.82	19.5	17.6	17.6	
DEC 9 71	THU	15	2.962	4.1	0.9	0.50	0.50	1.481	1.481	2.94	2.94	1.99	1.99	19.5	17.1	17.1	51.3
DEC 10 71	FRI	99	2.867	4.1	0.7	0.50	0.50	1.433	1.433	2.94	2.94	2.05	2.05	20.0	17.0	17.0	
DEC 11 71	SAT	15	2.406	3.6	0.8	0.50	0.50	1.203	1.203	2.94	2.94	2.44	2.44	20.0	16.1	16.1	41.1
DEC 12 71	SUN	99	2.455	3.4	0.9	0.50	0.50	1.227	1.227	2.94	2.94	2.40	2.40	20.0	16.2	16.2	
DEC 13 71	MON	15	2.878	3.9	0.8	0.50	0.50	1.439	1.439	2.94	2.94	2.04	2.04	20.0	17.0	17.0	
DEC 14 71	TUE	15	2.812	3.9	0.8	0.50	0.50	1.406	1.406	2.94	2.94	2.09	2.09	20.0	16.8	16.8	
DEC 15 71	WED	15	2.750	3.9	0.8	0.50	0.50	1.375	1.375	2.94	2.94	2.14	2.14	20.5	16.7	16.7	50.5
DEC 17 71	FRI	99	2.791	4.0	1.0	0.50	0.50	1.395	1.395	2.94	2.94	2.11	2.11	21.0	16.8	16.8	
DEC 18 71	SAT	15	2.308	3.7	0.9	0.50	0.50	1.154	1.154	2.94	2.94	2.55	2.55	19.5	15.9	15.9	
DEC 19 71	SUN	99	3.129	3.2	1.0	0.50	0.50	1.564	1.564	2.94	2.94	1.88	1.88	18.5	17.5	17.5	
DEC 20 71	MON	15	2.783	4.0	1.3	0.50	0.50	1.391	1.391	2.94	2.94	2.11	2.11	19.0	16.8	16.8	
DEC 21 71	TUE	99	2.481	3.8	0.9	0.50	0.50	1.240	1.240	2.94	2.94	2.37	2.37	19.0	16.2	16.2	
DEC 22 71	WED	99	2.113	3.5	0.9	0.50	0.50	1.056	1.056	2.94	2.94	2.78	2.78	18.5	15.5	15.5	
DEC 23 71	THU	99	1.856	3.0	1.7	0.50	0.50	0.928	0.928	2.94	2.94	3.17	3.17	18.0	15.0	15.0	
DEC 24 71	FRI	99	1.818	2.5	0.8	0.50	0.50	0.909	0.909	2.94	2.94	3.23	3.23	18.5	14.9	14.9	
DEC 25 71	SAT	99	1.002	1.9	0.7	0.50	0.50	0.501	0.501	2.94	2.94	5.87	5.87	19.0	13.3	13.3	
DEC 26 71	SUN	99	1.459	2.0	0.6	0.50	0.50	0.729	0.729	2.94	2.94	4.03	4.03	19.0	14.2	14.2	
DEC 27 71	MON	99	1.613	2.5	0.6	0.50	0.50	0.806	0.806	2.94	2.94	3.65	3.65	19.5	14.5	14.5	
DEC 28 71	TUE	15	1.647	2.6	0.7	0.50	0.50	0.823	0.823	2.94	2.94	3.57	3.57	19.0	14.6	14.6	21.6
DEC 29 71	WED	15	1.700	3.7	0.7	0.50	0.50	0.850	0.850	2.94	2.94	3.46	3.46	18.0	14.7	14.7	
DEC 30 71	THU	15	1.763	2.6	0.8	0.50	0.50	0.881	0.881	2.94	2.94	3.34	3.34	18.0	14.8	14.8	31.5
DEC 31 71	FRI	99	1.804	2.8	0.7	0.50	0.50	0.902	0.902	2.94	2.94	3.26	3.26	18.0	14.9	14.9	
JAN 1 72	SAT	99	1.465	2.3	2.6	0.50	0.50	0.732	0.732	2.93	2.93	4.00	4.00	18.0	14.2	14.2	
JAN 2 72	SUN	99	1.561	1.0	1.0	0.50	0.50	0.780	0.780	2.93	2.93	3.75	3.75	17.5	14.4	14.4	
JAN 3 72	MON	15	1.795	2.8	0.7	0.50	0.50	0.897	0.897	2.93	2.93	3.26	3.26	17.0	14.8	14.8	
JAN 4 72	TUE	15	1.960	2.9	0.8	0.50	0.50	0.980	0.980	2.93	2.93	2.99	2.99	18.0	15.2	15.2	32.4
JAN 5 72	WED	15	2.024	2.9	0.8	0.50	0.50	1.012	1.012	2.93	2.93	2.90	2.90	18.0	15.3	15.3	
JAN 6 72	THU	15	2.036	3.1	0.8	0.50	0.50	1.018	1.018	2.93	2.93	2.88	2.88	17.0	15.3	15.3	34.2
JAN 7 72	FRI	99	1.855	2.9	0.6	0.50	0.50	0.927	0.927	2.93	2.93	3.16	3.16	17.0	15.0	15.0	
JAN 8 72	SAT	15	1.719	2.5	0.6	0.50	0.50	0.859	0.859	2.93	2.93	3.41	3.41	16.5	14.7	14.7	
JAN 9 72	SUN	99	1.925	2.7	0.8	0.50	0.50	0.962	0.962	2.93	2.93	3.04	3.04	16.5	15.1	15.1	
JAN 10 72	MON	15	3.311	4.1	1.9	0.50	0.50	1.655	1.655	2.93	2.93	1.77	1.77	17.0	17.8	17.8	
JAN 11 72	TUE	15	3.293	4.3	1.3	0.50	0.50	1.646	1.646	2.93	2.93	1.78	1.78	17.0	17.7	17.7	27.7
JAN 12 72	WED	15	3.114	4.2	1.1	0.50	0.50	1.557	1.557	2.93	2.93	1.88	1.88	18.0	17.4	17.4	
JAN 13 72	THU	99	3.414	4.1	1.5	0.50	0.50	1.707	1.707	2.93	2.93	1.72	1.72	18.0	18.0	18.0	
JAN 14 72	FRI	99	3.143	4.2	1.2	0.50	0.50	1.571	1.571	2.93	2.93	1.86	1.86	18.0	17.4	17.4	
JAN 15 72	SAT	15	2.702	3.7	0.9	0.50	0.50	1.351	1.351	2.93	2.93	2.17	2.17	17.5	16.6	16.6	32.6
JAN 16 72	SUN	99	1.942	3.1	0.8	0.50	0.50	0.971	0.971	2.93	2.93	3.02	3.02	16.0	15.1	15.1	
JAN 17 72	MON	15	2.698	3.8	0.7	0.50	0.50	1.349	1.349	1.57	1.30	1.16	0.96	17.0	11.3	10.3	
JAN 18 72	TUE	15	2.801	4.0	0.8	0.50	0.50	1.400	1.400	1.57	1.30	1.12	0.93	17.0	11.5	10.5	43.4
JAN 19 72	WED	15	2.864	4.0	0.8	0.50	0.50	1.432	1.432	1.57	1.30	1.10	0.91	17.0	11.6	10.6	
JAN 20 72	THU	15	2.967	4.1	0.7	0.50	0.50	1.483	1.483	1.57	1.30	1.06	0.88	18.0	11.8	10.8	49.1
JAN 21 72	FRI	99	2.964	4.0	0.9	0.50	0.50	1.482	1.482	1.57	1.30	1.06	0.88	17.5	11.8	10.8	
JAN 22 72	SAT	15	2.608	3.8	0.8	0.50	0.50	1.304	1.304	1.57	1.30	1.20	1.00	17.5	11.1	10.1	41.3
JAN 23 72	SUN	99	2.350	3.6	0.7	0.50	0.50	1.175	1.175	1.57	1.30	1.34	1.11	18.0	10.6	9.6	
JAN 24 72	MON	15	2.988	4.1	0.8	0.50	0.50	1.494	1.494	1.57	1.30	1.05	0.87	18.0	11.9	10.8	

Date of Obsv	Day of Week	Samp Type	Bod Load 2	Org C Load 1	Org C Load 2	Bod EFF 1	Bod EFF 2	SS EFF 1	SS EFF 2	Org C EFF 1	Org C EFF 2	Inf Bod	P-1 Bod	F-1 Bod	S-1 Bod	P-2 Bod	F-2 Bod	S-2 Bod
NOV 19 69	WED	6																
NOV 19 69	WED	4	38.8	26.1	26.1	80.7	81.3			69.8	66.7	187	72	38	36	74	38	35
NOV 20 69	THU	6						85.0	80.1									
NOV 20 69	THU	4	38.1	25.7	25.7	80.7	81.3			69.8	66.7	187	72	38	36	74	38	35
NOV 21 69	FRI	6						71.0	68.2									
NOV 21 69	FRI	7	25.5	21.2	21.2	70.6	65.1			55.2	48.6	126	54	40	37	66	37	44
NOV 22 69	SAT	4						74.3	66.1									
NOV 22 69	SAT	7	21.5	17.9	17.9	70.6	65.1			55.2	48.6	126	54	40	37	66	37	44
NOV 23 69	SUN	4						74.3	66.1									
NOV 23 69	SUN	7	20.6	17.2	17.2	70.6	65.1			55.2	48.6	126	54	40	37	66	37	44
NOV 24 69	MON	6						69.4	68.9									
NOV 24 69	MON	4	34.0	25.2	25.2	78.4	77.8			71.7	65.4	171	71	36	37	71	31	38
NOV 25 69	TUE	6						92.5	93.2									
NOV 25 69	TUE	4	32.6	24.2	24.2	78.4	77.8			71.7	65.4	171	71	36	37	71	31	38
NOV 26 69	WED																	
NOV 27 69	THU																	
NOV 28 69	FRI																	
NOV 29 69	SAT	4	14.6	11.8	11.8	76.2	81.0	75.0	81.7	56.9	63.7	126	42	22	30	47	19	24
NOV 30 69	SUN	4	17.3	14.0	14.0	76.2	81.0	75.0	81.7	56.9	63.7	126	42	22	30	47	19	24
DEC 1 69	MON	6						77.8	78.3									
DEC 1 69	MON	4	26.0	21.9	21.9	71.9	72.6			58.8	57.0	135	35	36	38	62	48	37
DEC 2 69	TUE	6						74.8	69.7									
DEC 2 69	TUE	4	26.6	22.4	22.4	71.9	72.6			58.8	57.0	135	35	36	38	62	48	37
DEC 3 69	WED	6						89.4	85.6									
DEC 3 69	WED	4	26.7	20.2	20.2	77.0	74.8			62.7	52.9	135	64	25	31	40	38	34
DEC 4 69	THU	6						78.4	78.4									
DEC 4 69	THU	4	26.8	20.3	20.3	77.0	74.8			62.7	52.9	135	64	25	31	40	38	34
DEC 5 69	FRI	6						85.4	80.1									
DEC 5 69	FRI	7		18.8	18.8					64.3	66.3							
DEC 6 69	SAT	4						67.5	75.4									
DEC 6 69	SAT	7		16.1	16.1					64.3	66.3							
DEC 7 69	SUN	4						67.5	75.4									
DEC 7 69	SUN	7		17.5	17.5					64.3	66.3							
DEC 8 69	MON	6						79.4	54.1									
DEC 8 69	MON	4	40.2	21.0	21.0	75.5	73.6			51.3	58.3	220	69	41	54	87	56	58
DEC 9 69	TUE	6						79.0	79.0									
DEC 9 69	TUE	4	43.9	22.9	22.9	75.5	73.6			51.3	58.3	220	69	41	54	87	56	58
DEC 10 69	WED	6						83.0	85.2									
DEC 10 69	WED	4	41.0	27.1	27.1	71.0	73.5			65.4	68.2	162	72	36	47	62	52	43
DEC 11 69	THU	6						93.5	93.5									
DEC 11 69	THU	4	35.6	23.5	23.5	71.0	73.5			65.4	68.2	162	72	36	47	62	52	43
DEC 12 69	FRI	7	28.5	22.5	22.5	75.4	79.7			60.6	69.7	138	61	26	34	72	34	28
DEC 12 69	FRI	6						87.5	81.0									
DEC 13 69	SAT	7	25.0	19.7	19.7	75.4	79.7			60.6	69.7	138	61	26	34	72	34	28
DEC 13 69	SAT	4						81.0	83.2									
DEC 14 69	SUN	7	26.0	20.5	20.5	75.4	79.7			60.6	69.7	138	61	26	34	72	34	28
DEC 14 69	SUN	4						81.0	83.2									
DEC 15 69	MON	4	39.8			74.4	78.5					195	82	49	50	78	56	42
DEC 15 69	MON	6						81.1	89.6									
DEC 16 69	TUE	6						68.5	78.7									
DEC 16 69	TUE	4	38.0			74.4	78.5					195	82	49	50	78	56	42
DEC 17 69	WED	6						78.1	76.3									
DEC 17 69	WED	4																

Date of Obsv	Day of Week	Samp Type	Bod Load 2	Org C Load 1	Org C Load 2	Bod EFF 1	Bod EFF 2	SS EFF 1	SS EFF 2	Org C EFF 1	Org C EFF 2	Inf Bod	P-1 Bod	F-1 Bod	S-1 Bod	P-2 Bod	F-2 Bod	S-2 Bod
DEC 18 69	THU	6						77.8	87.6									
DEC 18 69	THU	4																
DEC 19 69	FRI																	
DEC 20 69	SAT																	
DEC 21 69	SUN																	
DEC 22 69	MON																	
DEC 23 69	TUE																	
DEC 24 69	WED																	
DEC 25 69	THU																	
DEC 26 69	FRI																	
DEC 27 69	SAT																	
DEC 28 69	SUN																	
DEC 29 69	MON	6						88.1	87.4									
DEC 29 69	MON	4	30.4			77.7	77.3					220	93		49	90	53	50
DEC 30 69	TUE	6						42.9	44.9									
DEC 30 69	TUE	4	30.2			77.7	77.3					220	93		49	90	53	50
JAN 1 70	THU																	
JAN 2 70	FRI																	
JAN 5 70	MON																	
JAN 6 70	TUE																	
JAN 7 70	WED																	
JAN 8 70	THU																	
JAN 9 70	FRI																	
JAN 10 70	SAT																	
JAN 11 70	SUN																	
JAN 12 70	MON																	
JAN 13 70	TUE																	
JAN 14 70	WED																	
JAN 15 70	THU																	
JAN 16 70	FRI																	
JAN 17 70	SAT	4	33.3			80.3	76.0	84.8	80.8			183	84	58	36	72	46	44
JAN 18 70	SUN	4	32.9			80.3	76.0	84.8	80.8			183	84	58	36	72	46	44
JAN 19 70	MON	4	38.0	29.3	29.3	81.4	76.5	84.1	84.1	68.1	66.0	183	65	46	34	82	56	43
JAN 20 70	TUE	4	36.9	28.4	28.4	81.4	76.5	84.1	84.1	68.1	66.0	183	65	46	34	82	56	43
JAN 21 70	WED	4	49.8	28.5	28.5	85.6	78.8	84.7	77.1	67.1	65.7	250	76	42	36	83	58	53
JAN 22 70	THU	4	50.1	28.7	28.7	85.6	78.8	84.7	77.1	67.1	65.7	250	76	42	36	83	58	53
JAN 23 70	FRI	7	31.2	26.3	26.3	79.4	74.5	71.2	71.2	69.8	66.9	165	67	34	34	46	65	42
JAN 24 70	SAT	7	28.2	23.7	23.7	79.4	74.5	71.2	71.2	69.8	66.9	165	67	34	34	46	65	42
JAN 25 70	SUN	7	26.1	22.0	22.0	79.4	74.5	71.2	71.2	69.8	66.9	165	67	34	34	46	65	42
JAN 26 70	MON	4		25.5	25.5			92.0	87.9	74.8	69.6							
JAN 27 70	TUE	4		24.1	24.1			92.0	87.9	74.8	69.6							
JAN 28 70	WED	4		25.6	25.6			78.2	88.3	70.1	72.1							
JAN 29 70	THU	4		28.0	28.0			78.2	88.3	70.1	72.1							
JAN 30 70	FRI	7		20.7	20.7			86.5	75.7	74.4	62.8							
JAN 31 70	SAT	7		18.4	18.4			86.5	75.7	74.4	62.8							
FEB 1 70	SUN	7		18.7	18.7			86.5	75.7	74.4	62.8							
FEB 2 70	MON	4	36.6	32.2	32.2	87.1	68.9			78.4	69.0	132	56	29	17	72	37	41
FEB 3 70	TUE	4	48.0	20.8	42.2	87.1	68.9			78.4	69.0	132	56	29	17	72	37	41
FEB 4 70	WED	4	59.9	13.5	27.4	74.2	71.6	52.8	64.2	42.5	46.0	190	83	42	49	114	58	54
FEB 5 70	THU	4	57.5	13.0	26.3	74.2	71.6	52.8	64.2	42.5	46.0	190	83	42	49	114	58	54
FEB 6 70	FRI																	
FEB 7 70	SAT	4	44.8	13.0	26.3	73.4	68.9	82.4	77.6	58.7	49.0	177	62	59	47	68	70	55
FEB 8 70	SUN	4	41.8	12.1	24.6	73.4	68.9	82.4	77.6	58.7	49.0	177	62	59	47	68	70	55

Date of Obsv	Day of Week	Samp Type	Bod Load 2	Org C Load 1	Org C Load 2	Bod EFF 1	Bod EFF 2	SS EFF 1	SS EFF 2	Org C EFF 1	Org C EFF 2	Inf Bod	P-1 Bod	F-1 Bod	S-1 Bod	P-2 Bod	F-2 Bod	S-2 Bod
FEB 9 70	MON	4	57.8	16.8	34.1	73.3	72.8	77.6	69.4	64.3	54.8	195	83	49	52	79	43	53
FEB 10 70	TUE	4	56.2	16.3	33.2	73.3	72.8	77.6	69.4	64.3	54.8	195	83	49	52	79	43	53
FEB 11 70	WED	4	62.1	19.3	39.2	80.9	61.4	79.3	55.2	64.7	50.4	220	85	65	42	132	84	85
FEB 12 70	THU	4	62.0	19.3	39.2	80.9	61.4	79.3	55.2	64.7	50.4	220	85	65	42	132	84	85
FEB 13 70	FRI	7	51.7	15.8	32.0	86.5	77.6	81.5	64.3	67.2	51.3	192	83	28	26	71	36	43
FEB 14 70	SAT	7	45.5	13.9	28.2	86.5	77.6	81.5	64.3	67.2	51.3	192	83	28	26	71	36	43
FEB 15 70	SUN	7	20.5	6.2	12.7	86.5	77.6	81.5	64.3	67.2	51.3	192	83	28	26	71	36	43
FEB 16 70	MON	4	67.7	25.9	52.6	71.6	65.4	71.9	67.7	65.9	60.3	162	65	47	46	84	65	56
FEB 17 70	TUE	4	64.4	24.7	50.1	71.6	65.4	71.9	67.7	65.9	60.3	162	65	47	46	84	65	56
FEB 18 70	WED	4	55.7	21.1	42.9	70.5	61.5	80.6	66.1	60.8	61.7	156	72	56	46	114	67	60
FEB 19 70	THU	4	51.7	19.6	39.8	70.5	61.5	80.6	66.1	60.8	61.7	156	72	56	46	114	67	60
FEB 20 70	FRI	7	53.5	20.4	41.4	89.8	76.8	80.9	75.3	72.3	64.2	177	74	24	18	65	71	41
FEB 21 70	SAT	7	47.5	18.1	36.8	89.8	76.8	80.9	75.3	72.3	64.2	177	74	24	18	65	71	41
FEB 22 70	SUN	7	42.8	16.3	33.1	89.8	76.8	80.9	75.3	72.3	64.2	177	74	24	18	65	71	41
FEB 23 70	MON	4	52.0	21.5	43.7	86.7	77.2	77.0	66.0	66.2	55.6	180	78	25	24	68	43	41
FEB 24 70	TUE	4	51.4	21.3	43.1	86.7	77.2	77.0	66.0	66.2	55.6	180	78	25	24	68	43	41
FEB 25 70	WED	4	66.0	22.3	45.2	85.0	70.0	91.9	77.3	74.7	63.0	213	72	47	32	93	68	64
FEB 26 70	THU	4	65.7	22.2	45.0	85.0	70.0	91.9	77.3	74.7	63.0	213	72	47	32	93	68	64
FEB 27 70	FRI																	
FEB 28 70	SAT																	
MAR 1 70	SUN																	
MAR 2 70	MON	4	78.2	25.5	51.9	77.0	69.3	80.0	68.7	69.3	60.9	270	111	67	62	126	111	83
MAR 3 70	TUE	4	77.9	25.4	51.6	77.0	69.3	80.0	68.7	69.3	60.9	270	111	67	62	126	111	83
MAR 4 70	WED	4	61.7	19.5	39.6	73.8	70.8	71.7	59.6	63.0	58.3	168	67	60	44	90	62	49
MAR 5 70	THU	4	65.2	20.7	41.9	73.8	70.8	71.7	59.6	63.0	58.3	168	67	60	44	90	62	49
MAR 6 70	FRI	7	48.1	18.8	38.2	78.7	66.7	82.1	80.5	89.3	63.4	141	66	35	30	89	26	47
MAR 7 70	SAT	7	39.4	15.4	31.3	78.7	66.7	82.1	80.5	89.3	63.4	141	66	35	30	89	26	47
MAR 8 70	SUN	7	38.7	15.1	30.7	78.7	66.7	82.1	80.5	89.3	63.4	141	66	35	30	89	26	47
MAR 9 70	MON	4	49.8	19.4	39.4	72.8	56.8	80.8	67.3	68.0	51.6	162	65	38	44	74	74	70
MAR 10 70	TUE	4	49.0	19.1	38.8	72.8	56.8	80.8	67.3	68.0	51.6	162	65	38	44	74	74	70
MAR 11 70	WED	4	43.6	13.2	26.7	71.4	55.1	81.8	75.0	52.2	42.2	147	59	41	42	78	67	66
MAR 12 70	THU	4	47.0	14.2	28.8	71.4	55.1	81.8	75.0	52.2	42.2	147	59	41	42	78	67	66
MAR 13 70	FRI	4	35.7	6.6	26.3	91.8	76.9	79.8	67.5	70.4	63.0	147	40	19	12	71	37	34
MAR 14 70	SAT	4	46.5	8.5	34.1	91.8	76.9	79.8	67.5	70.4	63.0	147	40	19	12	71	37	34
MAR 15 70	SUN																	
MAR 16 70	MON	4	72.7	12.5	49.9	89.2	73.0	84.5	66.5	72.1	58.6	204	54	43	22	83	73	55
MAR 17 70	TUE	4	70.1	12.0	48.1	89.2	73.0	84.5	66.5	72.1	58.6	204	54	43	22	83	73	55
MAR 18 70	WED	4	28.5	11.2	44.8	82.7	18.7	66.5	44.9	61.0	51.7	75	61	34	13	17	77	61
MAR 19 70	THU	4	28.2	11.1	44.4	82.7	18.7	66.5	44.9	61.0	51.7	75	61	34	13	17	77	61
MAR 20 70	FRI																	
MAR 21 70	SAT																	
MAR 22 70	SUN																	
MAR 23 70	MON	4		12.7	50.9			47.9	12.4	63.3	22.0							
MAR 24 70	TUE	4		11.3	45.1			47.9	12.4	63.3	22.0							
MAR 25 70	WED	4		8.6	34.3				55.5	62.6	29.7							
MAR 26 70	THU	4		7.2	28.8				55.5	62.6	29.7							
MAR 27 70	FRI																	
MAR 28 70	SAT																	
MAR 29 70	SUN																	
MAR 30 70	MON	4	37.1	7.3	29.2	89.7	72.2	58.6	54.3	50.5	40.4	126	60	69	13	80	20	35
MAR 31 70	TUE	4	55.2	10.9	43.4	89.7	72.2	58.6	54.3	50.5	40.4	126	60	69	13	80	20	35
APR 1 70	WED																	
APR 2 70	THU																	

Date of Obsv	Day of Week	Samp Type	Bod Load 2	Org C Load 1	Org C Load 2	Bod EFF 1	Bod EFF 2	SS EFF 1	SS EFF 2	Org C EFF 1	Org C EFF 2	Inf Bod	P-1 Bod	F-1 Bod	S-1 Bod	P-2 Bod	F-2 Bod	S-2 Bod
APR 3 70	FRI	7	96.3	11.9	47.5	89.2	74.2	74.0	46.0	69.5	43.8	213	58	47	23	83	76	55
APR 4 70	SAT	7	78.5	9.7	38.7	89.2	74.2	74.0	46.0	69.5	43.8	213	58	47	23	83	76	55
APR 5 70	SUN	7	70.7	8.7	34.9	89.2	74.2	74.0	46.0	69.5	43.8	213	58	47	23	83	76	55
APR 6 70	MON	4	65.7	10.3	41.1	84.8	59.1	80.7	62.8	60.7	42.1	171	70	55	26	88	83	70
APR 7 70	TUE	4	63.7	10.0	39.8	84.8	59.1	80.7	62.8	60.7	42.1	171	70	55	26	88	83	70
APR 8 70	WED	4	60.4	10.2	41.0	86.9	61.9	77.9	41.0	59.6	42.1	168	73	26	22	108	77	64
APR 9 70	THU	4	60.1	10.2	40.8	86.9	61.9	77.9	41.0	59.6	42.1	168	73	26	22	108	77	64
APR 10 70	FRI	7	61.4			85.8	71.6					183	65	35	26	92	80	52
APR 11 70	SAT	7	53.8			85.8	71.6					183	65	35	26	92	80	52
APR 12 70	SUN	7	50.3			85.8	71.6					183	65	35	26	92	80	52
APR 13 70	MON																	
APR 14 70	TUE																	
APR 15 70	WED	4	40.1		50.5		0.0		40.9		40.2	89				86	84	89
APR 16 70	THU	4	37.4	0.0	47.1		0.0		40.9		40.2	89				86	84	89
APR 17 70	FRI	7	66.2		33.3		72.3		37.7		22.5	177				61	68	49
APR 18 70	SAT	7	58.4		29.4		72.3		37.7		22.5	177				61	68	49
APR 19 70	SUN	7	55.6		28.0		72.3		37.7		22.5	177				61	68	49
APR 20 70	MON																	
APR 21 70	TUE																	
APR 22 70	WED																	
APR 23 70	THU																	
APR 24 70	FRI	7	53.0	0.0	52.2		46.9		64.3		56.3	130				108	105	69
APR 25 70	SAT	7	45.9		45.2		46.9		64.3		56.3	130				108	105	69
APR 26 70	SUN	7	43.2		42.5		46.9		64.3		56.3	130				108	105	69
APR 27 70	MON	4																
APR 28 70	TUE	4																
APR 29 70	WED	4																
APR 30 70	THU	4																
MAY 1 70	FRI	7	67.5		45.8		63.0		73.1		53.6	162				108	78	60
MAY 2 70	SAT	7	61.0		41.4		63.0		73.1		53.6	162				108	78	60
MAY 3 70	SUN	7	62.1		42.1		63.0		73.1		53.6	162				108	78	60
MAY 4 70	MON																	
MAY 5 70	TUE																	
MAY 6 70	WED	4	83.2		32.4		68.4		92.5		10.8	190				102	60	60
MAY 7 70	THU	4	82.8		32.3		68.4		92.5		10.8	190				102	60	60
MAY 8 70	FRI																	
MAY 9 70	SAT																	
MAY 10 70	SUN	6	54.7		31.5		61.2		57.5		46.9	170				90	159	66
MAY 11 70	MON																	
MAY 12 70	TUE	6	75.3	0.0	49.0		53.3		70.6		46.2	180				96	156	84
MAY 13 70	WED																	
MAY 14 70	THU																	
MAY 15 70	FRI																	
MAY 16 70	SAT																	
MAY 17 70	SUN	6	12.1	10.9	10.9	58.3	72.2	96.9	92.9	50.8	52.3	72	50	28	30	52	42	20
MAY 18 70	MON																	
MAY 19 70	TUE																	
MAY 20 70	WED	6	22.0	19.1	19.1	23.7	57.9	46.3	76.9	59.6	59.6	114	62	96	141	102	141	48
MAY 21 70	THU	6	33.8	22.4	22.4	65.5	64.4	61.2	87.9	67.8	68.7	174	102	52	60	102	246	62
MAY 22 70	FRI																	
MAY 23 70	SAT																	
MAY 24 70	SUN	6	10.7	13.7	13.7	97.2	80.6	88.5	88.5	70.7	47.8	72	23		2	54	14	14
MAY 25 70	MON																	

Date of Obsv	Day of Week	Samp Type	Bod Load 2	Org C Load 1	Org C Load 2	Bod EFF 1	Bod EFF 2	SS EFF 1	SS EFF 2	Org C EFF 1	Org C EFF 2	Inf Bod	P-1 Bod	F-1 Bod	S-1 Bod	P-2 Bod	F-2 Bod	S-2 Bod
MAY 26 70	TUE	6		16.1	16.1			70.7	62.1	59.8	54.0							
MAY 27 70	WED																	
MAY 28 70	THU	6		21.9	21.9			45.2	44.4	71.8	72.5							
MAY 29 70	FRI																	
MAY 30 70	SAT																	
MAY 31 70	SUN	6	7.0	14.2	14.2	90.7	63.0	78.8	81.7	72.5	65.1	54	14	9	5	21	18	20
JUN 1 70	MON																	
JUN 2 70	TUE	6	18.5	17.5	17.5	85.0	92.5	79.5	84.1	74.3	69.9	120	15	14	18	33	26	9
JUN 3 70	WED																	
JUN 4 70	THU	6	23.4	20.1	20.1	88.7	84.0	87.1	91.3	73.6	64.3	150	30	17	17	42	28	24
JUN 5 70	FRI																	
JUN 6 70	SAT																	
JUN 7 70	SUN	6	6.3	11.4	11.4	87.5	83.3	79.9	90.6	63.2	59.8	48	12	8	6	21	15	8
JUN 8 70	MON																	
JUN 9 70	TUE	6	6.1	13.3	13.3	86.1	72.2	87.3	81.9	50.0	48.7	36	11	3	5	18	12	10
JUN 10 70	WED	9		20.3	20.3			86.6	83.6	59.6	57.9							
JUN 11 70	THU	9	17.7	24.7	24.7	89.2	80.4	95.3	89.5	80.3	72.5	102	20	14	11	47		20
JUN 12 70	FRI																	
JUN 13 70	SAT																	
JUN 14 70	SUN	6	8.6	17.3	17.3	86.4	86.4	88.1	82.5	75.8	67.4	66	17	14	9	23	17	9
JUN 15 70	MON	6		17.0	17.0			79.6	68.9	66.7	53.5							
JUN 16 70	TUE	6	23.5	22.0	22.0	85.9	74.8	75.2	65.5	66.7	51.6	135	32	27	19	50	31	34
JUN 17 70	WED	6		23.0	23.0			90.3	83.3	72.0	69.7							
JUN 18 70	THU	6	24.6	17.7	17.7	89.6	85.4	83.8	74.0	67.3	53.8	144	39	35	15	54	29	21
JUN 19 70	FRI																	
JUN 20 70	SAT																	
JUN 21 70	SUN	6	22.2	13.8	13.8	83.9	83.9	87.9	87.1	62.9	58.1	168	42	39	27	66	53	27
JUN 22 70	MON	6		18.0	18.0			73.9	76.5	62.5	51.9							
JUN 23 70	TUE	6	22.5	20.7	20.7	82.6	87.1	85.7	82.1	67.8	59.5	132	38	27	23	45	29	17
JUN 24 7C	WED	6		22.6	22.6			84.1	78.3	70.9	64.9							
JUN 25 70	THU	6	30.3	37.7	37.7	92.4	87.5	81.5	72.2	79.3	72.1	144	30	17	11	68	53	18
JUN 26 70	FRI																	
JUN 27 70	SAT																	
JUN 28 70	SUN	6	15.8	12.9	12.9	69.1	68.3	73.9	68.3	57.0	52.0	123	45	21	38	56	45	39
JUN 29 70	MON																	
JUN 30 70	TUE	6	25.9	18.0	18.0	84.7	87.3	88.3	81.6	66.3	60.6	150	31	23	23	66	29	19
JUL 1 70	WED	6		23.5	23.5			88.5	83.2	75.4	67.2							
JUL 2 70	THU	6	19.6	21.0	21.0		70.9		73.0		69.6	117	36	57		54	32	34
JUL 3 70	FRI																	
JUL 4 70	SAT																	
JUL 5 70	SUN	6	15.1	14.0	14.0	85.5	91.5	93.0	89.8	72.5	73.4	117	28	16	17	44	19	10
JUL 6 70	MON	6																
JUL 7 70	TUE	6																
JUL 8 70	WED	6		17.0	17.0			89.7	74.3	70.6	58.8							
JUL 9 70	THU	6	25.2	22.0	22.0	82.7	78.7	88.5	79.9	74.8	65.6	150	31	28	26	61	30	32
JUL 10 70	FRI																	
JUL 11 70	SAT																	
JUL 12 70	SUN	6	20.9	16.0	16.0	89.3	81.3	91.7	86.4	75.7	70.4	150	32	29	16	47	71	28
JUL 13 70	MON	6		17.1	17.1			92.9	84.5	74.7	64.6							
JUL 14 70	TUE	6																
JUL 15 70	WED																	
JUL 16 70	THU																	
JUL 17 70	FRI																	

Date of Obsv	Day of Week	Samp Type	Bod Load 2	Org C Load 1	Org C Load 2	Bod EFF 1	Bod EFF 2	SS EFF 1	SS EFF 2	Org C EFF 1	Org C EFF 2	Inf Bod	P-1 Bod	F-1 Bod	S-1 Bod	P-2 Bod	F-2 Bod	S-2 Bod
JUL 18 70	SAT																	
JUL 19 70	SUN	6																
JUL 20 70	MON	6																
JUL 21 70	MON																	
JUL 22 70	TUE																	
JUL 23 70	THU	6		32.6	16.1			85.6	77.8	64.7	69.8							
JUL 24 70	THU																	
JUL 25 70	FRI																	
JUL 26 70	SUN	6	8.3	16.5	8.1	72.6	78.9	89.1	82.2	60.2	64.5	95	36	41	26	28	25	20
JUL 27 70	MON	6		34.6	17.1			88.2	87.5	72.3	79.1							
JUL 28 70	TUE	6		18.6	9.2			73.1	63.9	25.0	38.8							
JUL 29 70	WED																	
JUL 30 70	THU																	
JUL 31 70	FRI																	
AUG 1 70	SAT																	
AUG 2 70	SUN																	
AUG 3 70	MON																	
AUG 4 70	TUE																	
AUG 5 70	WED	6		24.5	12.1			81.1	82.2	63.7	65.5							
AUG 6 70	THU	6	20.5	34.7	17.1	78.3	90.0	87.8	89.1	60.0	67.0	120	50	31	26	44	18	12
AUG 7 70	FRI																	
AUG 8 70	SAT																	
AUG 9 70	SUN	6	31.6	24.3	12.0	94.1	86.3	89.2	87.6	60.3	67.2	306	23		18	30		42
AUG 10 70	MON	6		30.0	14.8			90.7	90.7	63.5	61.5							
AUG 11 70	TUE																	
AUG 12 70	WED	6		25.1	12.4			91.7	93.3	61.5	65.1							
AUG 13 70	THU	6	15.1	26.3	12.9	81.2	87.0	89.0	90.2	66.1	70.3	138	49	32	26	42		18
AUG 14 70	FRI																	
AUG 16 70	SUN	6				84.4	75.0	89.1	89.8	67.5	75.0	192	40	23	30	48		48
AUG 17 70	MON	6						95.7	96.9	73.9	80.1							
AUG 18 70	TUE	11	24.3	32.6	16.1	89.2	88.3	90.9	85.8	79.2	75.5	240	59	32	26	42	36	28
AUG 19 70	WED																	
AUG 20 70	THU	6	21.6	26.8	13.2	86.7	89.4	90.1	93.1	65.2	71.3	188	51	36	25	39	22	20
AUG 21 70	FRI																	
AUG 23 70	SUN																	
AUG 24 70	MON	6		20.1	9.9			91.0	92.5	64.4	66.7							
AUG 25 70	TUE	6	10.0	19.5	9.6	89.6	93.8	91.7	91.7	70.7	70.7	96	30	32	10	36	50	6
AUG 26 70	WED	6		28.5	14.0			95.1	93.6	72.3	75.9							
AUG 27 70	THU	6	11.2	19.3	9.5	69.3	90.4	80.2	90.5	62.9	73.2	114	47	20	35	30	58	11
AUG 28 70	FRI																	
AUG 29 70	SAT																	
AUG 30 70	SUN	6	15.5	12.0	5.9	80.2	80.2	88.1	91.7	53.4	58.9	192	54	34	38		36	38
AUG 31 70	MON	6		18.8	9.2			94.7	96.7	63.3	68.9							
SEP 1 70	TUE	6	20.1	15.1	15.1	75.8	83.3	94.9	94.9	70.7	71.7	132	42	20	32	51	20	22
SEP 2 70	WED	6		13.2	13.2			87.3	90.4	56.8	56.8							
SEP 3 70	THU	6	26.9	14.4	14.4	84.2	83.1	90.6	84.3	61.1	61.1	177	62	62	28	74	28	30
SEP 6 70	SUN																	
SEP 7 70	MON	6		23.9	23.9			94.5	94.0	84.6	85.1							
SEP 8 70	TUE	6	20.0	14.3	14.3	83.3	83.3	93.9	90.1	68.1	60.6	132	54	30	22	60	40	22
SEP 8 70	TUE	10																
SEP 9 70	WED																	
SEP 10 70	THU	6	22.8	20.2	20.2	79.9	80.6	92.7	92.2	71.9	74.2	144	99	35	29	65	29	28
SEP 10 70	THU	10																

Date of Obsv	Day of Week	Samp Type	Bod Load 2	Org C Load 1	Org C Load 2	Bod EFF 1	Bod EFF 2	SS EFF 1	SS EFF 2	Org C EFF 1	Org C EFF 2	Inf Bod	P-1 Bod	F-1 Bod	S-1 Bod	P-2 Bod	F-2 Bod	S-2 Bod
SEP 11 70	FRI																	
SEP 12 70	SAT																	
SEP 13 70	SUN	6	18.5	15.7	15.7	49.5	55.9	81.3	89.6	64.9	63.8	111	55	23	56	63	43	49
SEP 13 70	SUN	12																
SEP 14 70	MON	6		15.8	15.8			86.4	77.3	62.5	51.3							
SEP 15 70	TUE	6	27.4	20.9	20.9	85.2		95.2		72.8		135	61	20	20	69	32	
SEP 15 70	TUE	12																
SEP 16 70	WED	6		19.0	19.0			91.7	89.9	68.1	62.6							
SEP 17 70	THU	12																
SEP 17 70	THU	6	38.7	33.0	33.0	84.2	80.8		88.9	73.5	71.5	177	73	29	28	75	42	34
SEP 18 70	FRI																	
SEP 19 70	SAT																	
SEP 20 70	SUN	6	20.5	21.0	21.0	82.9	76.6	89.3	86.4	71.1	61.4	111	60	74	19	68	49	26
SEP 20 70	SUN	12																
SEP 21 70	MON	6		23.1	23.1			94.3	88.5	72.1	60.6							
SEP 22 70	TUE	6	31.9	34.6	34.6	87.2	80.1	93.7	90.5	74.5	69.3	141	56	20	18	59	41	28
SEP 22 70	TUE	12																
SEP 23 70	WED	6		28.0	28.0			92.1	69.3	76.0	70.4							
SEP 24 70	THU	12																
SEP 24 70	THU	6	27.2	23.9	23.9	86.2	75.6	90.2	79.0	63.9	60.2	123	63	26	17	80	38	30
SEP 25 70	FRI																	
SEP 26 70	SAT																	
SEP 27 70	SUN	6	26.1	19.1	19.1	85.8	69.5	90.4	88.8	66.0	58.3	141	59	56	20	65	30	43
SEP 27 70	SUN	12																
SEP 28 70	MON	6		25.8	25.8			85.6	82.0	39.8	56.8							
SEP 29 70	TUE	6	30.9	26.4	26.4	82.6	71.5	88.0	78.9	69.9	62.6	144	71	36	25	72	46	41
SEP 29 70	TUE	12																
SEP 30 70	WED	6		23.9	23.9			88.7	82.7	67.9	62.5							
OCT 1 70	THU	12																
OCT 1 70	THU	6	40.2	16.6	33.8	77.5	71.0	88.0	83.1	63.8	56.0	138	79	35	31	84	43	40
OCT 2 70	FRI																	
OCT 3 70	SAT																	
OCT 4 70	SUN	4																
OCT 4 70	SUN	13	30.0	9.8	20.0	85.3	78.7	92.5	87.4	67.0	57.0	150	37	46	22	71	44	32
OCT 5 70	MON	6		12.2	24.7			88.7	84.0	36.7	18.9							
OCT 6 70	TUE	6	38.1	0.0	40.6		26.7		59.3		21.9	90				92	81	66
OCT 6 70	TUE	4																
OCT 8 70	THU																	
OCT 7 70	WED																	
OCT 9 70	FRI																	
OCT 10 70	SAT																	
OCT 11 70	SUN																	
OCT 12 70	MON																	
OCT 13 70	TUE																	
OCT 14 70	WED																	
OCT 15 70	THU																	
OCT 16 70	FRI																	
OCT 17 70	SAT																	
OCT 18 70	SUN	6	25.9	11.7	23.8	80.8	50.8	87.3	67.1	66.4	42.7	120	32	58	23	59	78	59
OCT 18 70	SUN	12																
OCT 19 70	MON	6						92.4	81.7									
OCT 20 70	TUE	12																
OCT 20 70	TUE	6	37.2			76.7	68.2	67.4	70.3			129	46	29	30	78	47	41

Date of Obsv	Day of Week	Samp Type	Bod Load 2	Org C Load 1	Org C Load 2	Bod EFF 1	Bod EFF 2	SS EFF 1	SS EFF 2	Org C EFF 1	Org C EFF 2	Inf Bod	P-1 Bod	F-1 Bod	S-1 Bod	P-2 Bod	F-2 Bod	S-2 Bod
OCT 21 70	WED	6						86.3	81.1									
OCT 22 70	THU	6	38.4	13.6	27.7	81.1	59.8	76.8	71.1	57.9	40.0	132	44	24	25	68	41	53
OCT 22 70	THU	12																
OCT 23 70	FRI																	
OCT 24 70	SAT																	
OCT 25 70	SUN	13	29.5	12.6	25.5	86.5	57.9	89.4	79.8	47.7	76.1	126	43	28	17	67	32	53
OCT 25 70	SUN	12																
OCT 26 70	MON	6		17.8	36.1			90.3	77.0	66.7	54.8							
OCT 27 70	TUE	6	42.8	17.8	36.2	84.7	76.0	85.3	82.4	60.6	48.8	150	40	26	23	70	40	36
OCT 27 70	TUE	12																
OCT 28 70	WED	6		15.1	30.6			92.8	76.3	67.3	48.2							
OCT 29 70	THU	6	52.4	18.0	36.6	54.8	45.7	10.2	-1.8	18.5	-5.4	186	83	99	84	85	85	101
OCT 29 70	THU	12																
OCT 30 70	FRI																	
OCT 31 70	SAT																	
NOV 1 70	SUN	6	37.6	15.4	31.2	85.5	65.8	90.1	80.3	72.2	61.9	117	26	23	17	46	34	40
NOV 1 70	SUN	10																
NOV 2 70	MON	6																
NOV 3 70	TUE																	
NOV 4 70	WED																	
NOV 5 70	THU	6	42.4	19.9	40.5	79.7	61.4	90.3	63.4	65.8	45.9	153	74	47	31		72	59
NOV 5 70	THU	10																
NOV 6 70	FRI																	
NOV 7 70	SAT																	
NOV 8 70	SUN	6	39.5	16.0	32.6	77.0	72.1	91.5	85.3	65.4	56.6	165	83	54	38	61	52	46
NOV 8 70	SUN	10																
NOV 9 70	MON	6		15.2	30.8			87.7	78.3	54.5	53.6							
NOV 10 70	TUE	6	43.4	14.9	30.3	81.4	69.0	73.4	67.5	75.6	60.0	129	36	36	24	64	37	40
NOV 10 70	TUE	10																
NOV 11 70	WED	6		14.0	28.4			87.6	69.0	66.7	53.1							
NOV 12 70	THU																	
NOV 13 70	FRI																	
NOV 14 70	SAT																	
NOV 15 70	SUN																	
NOV 16 70	MON																	
NOV 17 70	TUE																	
NOV 18 70	WED																	
NOV 19 70	THU																	
NOV 20 70	FRI																	
NOV 21 70	SAT																	
NOV 22 70	SUN																	
NOV 23 70	MON																	
NOV 24 70	TUE	6		16.2	33.0			78.6	66.2	66.1	46.5							
NOV 25 70	THU																	
NOV 26 70	THU																	
NOV 27 70	FRI																	
NOV 28 70	SAT																	
NOV 29 70	SUN	6	28.6	12.1	24.5	85.0	73.9	91.1	73.2	69.5	57.3	153	30	31	23	66	65	40
NOV 30 70	MON	6		18.2	37.0			83.7	76.7	64.3	48.1							
DEC 1 70	TUE	6	42.1	17.9	36.3	86.4	71.4	90.0	73.5	72.4	60.6	147	36	28	20	86	48	42
DEC 1 70	TUE	12																
DEC 2 70	WED	6		18.6	37.8			84.1	70.7	63.9	48.1							
DEC 3 70	THU	6	38.7	16.7	34.0	80.3	56.1	64.9	50.7	60.3	37.9	132	28	31	26	81	64	58

Date of Obsv	Day of Week	Samp Type	Bod Load 2	Org C Load 1	Org C Load 2	Bod EFF 1	Bod EFF 2	SS EFF 1	SS EFF 2	Org C EFF 1	Org C EFF 2	Inf Bod	P-1 Bod	F-1 Bod	S-1 Bod	P-2 Bod	F-2 Bod	S-2 Bod
DEC 3 70	THU	12																
DEC 4 70	FRI	99																
DEC 5 70	SAT	99																
DEC 6 70	SUN	6	43.7	7.8	31.1	88.2	69.3	90.6	73.2	76.1	57.8	153	30	26	18	83	56	47
DEC 6 70	SUN	12																
DEC 7 70	MON	99																
DEC 8 70	TUE	6	56.2	11.2	45.0	83.0	45.5	79.2	50.0	70.5	34.8	165	43	34	28			90
DEC 8 70	TUE	12																
DEC 9 70	WED	6		11.7	47.0				57.2		81.0							
DEC 10 70	THU	6	59.6	13.1	52.4		50.0		56.5		52.3	174	56	31				87
DEC 10 70	THU	12																
DEC 11 70	FRI	99																
DEC 12 70	SAT	99																
DEC 13 70	SUN	6	37.7	8.0	31.8	85.2	51.1	77.8	71.4	64.9	40.4	135	29	19	20	98	86	66
DEC 14 70	MON	6		12.3	49.1			94.0	67.1	79.0	47.6							
DEC 15 70	TUE	6	52.2	10.6	42.3	92.8	55.6	93.4	56.6	79.8	46.0	153	26	13	11	104	100	68
DEC 16 70	WED	11		24.9	99.7			91.7		81.2								
DEC 17 70	THU	6		11.3	45.3			92.0	52.2	78.8	46.6							
DEC 20 70	SUN	6		5.9	23.7			97.6	62.1	70.6	29.4							
DEC 21 70	MON	6		7.5	29.9			97.9	69.0	79.4	86.0							
DEC 22 70	TUE	99																
DEC 23 70	WED	99																
DEC 24 70	THU	99																
DEC 25 70	FRI	99																
DEC 26 70	SAT	99																
DEC 27 70	SUN	6		4.5	17.9			94.7	74.8	76.1	63.0							
DEC 28 70	MON	6		8.5	34.1			95.5		82.9	63.7							
DEC 29 70	TUE	6	32.4	7.6	30.5	91.5	74.5	91.1	76.4	81.2	60.2	141	23	13	12	52	38	36
DEC 30 70	WED	6		6.7	26.9			87.7	76.7	75.2	53.7							
DEC 31 70	THU	99																
JAN 1 71	FRI	99																
JAN 2 71	SAT	99																
JAN 3 71	SUN	6	33.1	6.7	26.6	95.9	68.3	93.5	76.8	78.8	54.5	123	19	6	5	62	45	39
JAN 4 71	MON	6		11.3	45.0			89.5	68.1	80.0	57.5							
JAN 5 71	TUE	6	24.1	7.2	28.6	89.9	65.2	89.3	62.6	75.6	53.7	69	13	44	7	41	17	24
JAN 6 71	WED	6		6.4	25.5			91.1	40.0	78.8	42.3							
JAN 7 71	THU	6	27.5	5.7	22.7	92.2	38.2	89.2	57.7	72.6	28.6	102	24	16	8	78	81	63
JAN 8 71	FRI	99																
JAN 9 71	SAT	99																
JAN 10 71	SUN	6	34.5	8.2	32.9	84.8	70.5	91.5	52.7	65.0	22.0	105	24	18	16	24	19	31
JAN 11 71	MON	6		7.4	29.7			85.8	31.7	68.8	32.5							
JAN 12 71	TUE	6	41.2	10.1	40.4	79.0	54.3	82.9	64.8	62.1	46.6	105	32	25	22		24	48
JAN 13 71	WED	6		8.4	33.7			91.4	65.0	70.0	36.7							
JAN 14 71	THU	6	54.6	13.0	52.0	89.1	47.6	90.6	42.5	77.9	83.6	147	41	17	16	86	77	77
JAN 15 71	FRI	99																
JAN 16 71	SAT	99																
JAN 17 71	SUN	6	43.7	9.4	37.6	86.1	47.9	88.8	66.0	81.5	50.8	144	44	22	20	66	56	75
JAN 18 71	MON	6		41.4	20.4			80.0	55.6	81.9	60.1							
JAN 19 71	TUE	6	41.5	19.0	38.6	74.3	52.1	75.3	54.4	70.1	48.5	144	72	38	37	108	71	69
JAN 20 71	WED	6		14.1	28.6			81.3	52.8	62.4	37.6							
JAN 21 71	THU	6	52.8	17.9	36.3	78.5	61.8	89.5	56.5	65.6	39.1	186	92	41	40	117	92	71
JAN 22 71	FRI	99																
JAN 23 71	SAT	99																

Date of Obsv	Day of Week	Samp Type	Bod Load 2	Org C Load 1	Org C Load 2	Bod EFF 1	Bod EFF 2	SS EFF 1	SS EFF 2	Org C EFF 1	Org C EFF 2	Inf Bod	P-1 Bod	F-1 Bod	S-1 Bod	P-2 Bod	F-2 Bod	S-2 Bod
JAN 24 71	SUN	6	43.9	16.1	32.8	85.5	70.9	93.9	78.3	71.5	55.3	165	67	37	24	100	69	48
JAN 25 71	MON	6		20.0	40.5			87.6	60.9	72.6	59.3							
JAN 26 71	TUE	6	31.0	14.3	29.0	82.0	52.3	85.0	56.3	73.1	48.1	111	54	28	20	90	66	53
JAN 27 71	WED	6		13.1	26.6			87.9	56.1	66.3	53.8							
JAN 28 71	THU	6	31.4	14.9	30.2	82.2	61.2	89.2	66.9	70.2	53.2	129	72	28	23	102	74	50
JAN 29 71	FRI	99																
JAN 30 71	SAT	99																
JAN 31 71	SUN	99																
FEB 1 71	MON	6		20.0	40.5			84.4	53.1	70.1	54.6							
FEB 2 71	TUE	6	60.4	28.5	57.8	68.8	63.0	74.5	69.8	59.8	50.8	138	66	38	43	95	68	51
FEB 3 71	WED	6		12.9	26.2			72.8	57.6	46.3	49.6							
FEB 4 71	THU	6	29.2	13.3	26.9	64.0	58.8	74.2	52.3	56.2	47.6	114	68	73	41	74	63	47
FEB 5 71	FRI	99																
FEB 6 71	SAT	99																
FEB 7 71	SUN	6	35.6	13.3	27.1	67.5	73.0	83.1	73.1	61.5	58.3	126	86	71	41	75	37	34
FEB 8 71	MON	6		12.2	24.8			53.8	70.9	40.3	51.9							
FEB 9 71	TUE	6	24.1	14.0	28.4	56.0	59.5	61.8	36.6	45.5	55.6	84	56	36	37	71	45	34
FEB 10 71	WED	6		15.7	31.8			64.1	64.1	47.9	47.1							
FEB 11 71	THU	6	39.2	18.2	37.0	54.1	62.9	47.3	57.4	50.0	48.0	159	83	77	73	89	80	59
FEB 12 71	FRI	99																
FEB 13 71	SAT	99																
FEB 14 71	SUN	6	35.8	12.8	26.1	51.0	53.1	68.1	43.6	54.2	48.6	147	77	74	72	83	61	69
FEB 15 71	MON	6		15.0	30.5			48.9	46.6	43.2	46.6							
FEB 16 71	TUE	6	29.0	22.7	22.7	48.1	69.9	39.9	34.8	42.6	50.0	156	77	96	81	48	71	47
FEB 17 71	WED	6		20.5	20.5			25.5	10.2	49.1	43.0							
FEB 18 71	THU	6	25.2	26.9	26.9	44.4	59.0	59.2	47.9	51.9	57.8	144	93	86	80	92	80	59
FEB 19 71	FRI	99																
FEB 20 71	SAT	99																
FEB 21 71	SUN	6	19.0	21.6	21.6	48.6	50.7	41.0	39.9	51.0	54.8	138	102	93	71	93	72	68
FEB 22 71	MON	6		25.2	25.2			60.7	33.2	39.5	36.4							
FEB 23 71	TUE	6	20.0	20.2	20.2	43.0	61.4	55.8	66.9	33.9	42.6	114	77	102	65	80	63	44
FEB 24 71	WED	6		15.2	15.2			54.7	57.8	25.3	42.9							
FEB 25 71	THU	6	24.8	21.2	21.2	41.7	65.3	52.9	55.4	43.1	52.8	144	100	104	84	86	66	50
FEB 26 71	FRI	99																
FEB 27 71	SAT	99																
FEB 28 71	SUN	6	20.3	12.9	12.9	46.7	60.7	55.2	64.8	34.7	42.1	150	87	92	80	90	80	59
MAR 1 71	MON	6		18.2	18.2			70.4	73.1	47.5	58.3							
MAR 2 71	TUE	6	23.1	21.1	21.1	41.4	63.1	63.5	56.5	34.7	58.4	111	93	81	65	87	54	41
MAR 3 71	WED	6																
MAR 4 71	THU	6	20.6	19.5	19.5	51.1	70.0	63.1	72.5	55.3	64.7	90	71	54	44	80	39	27
MAR 5 71	FRI	99																
MAR 6 71	SAT	99																
MAR 7 71	SUN	6	17.4	16.8	16.8	51.9	51.9	43.2	59.2	24.4	48.7	81	68	51	39	68	32	39
MAR 8 71	MON	6		24.2	24.2			50.5	19.9	27.1	14.6							
MAR 9 71	TUE	6	28.9	25.5	25.5	54.7	28.2	71.7	59.0	49.5	45.6	117	66	65	53	72	60	84
MAR 10 71	WED	6																
MAR 11 71	THU	6	40.9	30.7	30.7	56.4	63.6	69.3	64.2	48.4	49.2	165	86	92	72	86	69	60
MAR 12 71	FRI	99																
MAR 13 71	SAT	99																
MAR 14 71	SUN	6	22.0	19.8	19.8	52.1	62.4	60.2	54.4	52.4	49.5	117	75	71	56	74	66	44
MAR 15 71	MON	6		29.8	29.8			63.8	55.8	43.0	48.8							
MAR 16 71	TUE	6	25.2	27.0	27.0	50.0	67.5	65.4	65.4	58.5	63.7	126	78	75	63	74	71	41
MAR 17 71	WED	6		34.3	34.3			72.8	75.1	47.2	52.0							

Date of Obsv	Day of Week	Samp Type	Bod Load 2	Org C Load 1	Org C Load 2	Bod EFF 1	Bod EFF 2	SS EFF 1	SS EFF 2	Org C EFF 1	Org C EFF 2	Inf Bod	P-1 Bod	F-1 Bod	S-1 Bod	P-2 Bod	F-2 Bod	S-2 Bod
MAR 18 71	THU	6	38.3	22.4	22.4	54.3	66.7			25.3	45.3	162	79	65	74	71	69	54
MAR 19 71	FRI	99																
MAR 20 71	SAT	99																
MAR 21 71	SUN	6	33.2	25.6	25.6	66.7	72.5	63.8	58.3	50.8	52.3	171	89	94	57	87	78	47
MAR 22 71	MON	6		37.7	37.7			68.7	53.8	77.5	66.3							
MAR 23 71	TUE	6	41.5	32.5	32.5	45.6	63.9	50.0	40.8	34.8	34.0	180	93	86	98	69	78	65
MAR 24 71	WED	6																
MAR 25 71	THU	6	42.8			66.7	69.9	64.7	64.1			186	77	90	62	102	96	56
MAR 26 71	FRI	99																
MAR 27 71	SAT	99																
MAR 28 71	SUN	6		15.2	15.2			49.7	48.3	33.3	40.0							
MAR 29 71	MON	6		23.7	23.7			19.1	36.9	43.8	44.8							
MAR 30 71	TUE	6	20.6	20.6	20.6	59.4	40.6	55.8	39.7	40.6	22.9	96	45	56	39	56	53	57
MAR 31 71	WED	6		18.6	18.6			45.1	68.8	41.7	55.2							
APR 1 71	THU	6	22.2	17.6	17.6	45.8	33.3			23.2	17.9	120	48	54	65	59	56	80
APR 2 71	FRI	99																
APR 3 71	SAT	99																
APR 4 71	SUN	6		17.1	17.1			68.5	78.1	52.6	61.9		47	45	62	59	57	62
APR 5 71	MON	6		25.8	25.8			62.4	64.7	49.5	52.5							
APR 6 71	TUE	6	30.7	34.4	34.4	69.7	67.7	63.2	67.3	55.9	57.7	99	51	36	30	56	45	32
APR 7 71	WED	6		27.8	27.8			72.6	59.5	62.8	54.3							
APR 8 71	THU	6	32.4	31.3	31.3	75.0	55.0	44.7	64.6	52.6	44.8	120	44	38	30	75	76	54
APR 9 71	FRI	99																
APR 10 71	SAT	99																
APR 11 71	SUN	99																
APR 12 71	MON	6		26.8	26.8			69.0	56.0	50.0	39.8							
APR 13 71	TUE	6	37.1	37.8	37.8	74.5	47.7	67.6	53.6	59.0	53.8	153	63	48	39	89	83	80
APR 14 71	WED	6		30.6	30.6					58.0	48.9							
APR 15 71	THU	6	35.9	31.2	31.2	72.5	53.6	61.3	64.4	49.6	40.6	153	63	42	42	87	78	71
APR 16 71	FRI	99																
APR 17 71	SAT	99																
APR 18 71	SUN	6	29.4	27.0	27.0	78.4		79.1	64.6	60.4	49.7	162	62	47	35	84	75	
APR 19 71	MON	6		32.4	32.4			85.2	80.1	68.7	55.8							
APR 20 71	TUE	6	29.0	28.1	28.1	74.4	37.2	72.7	63.9	60.0	53.6	129	47	42	33	72	47	81
APR 21 71	WED	6		28.8	28.8			90.2	75.1	65.3	58.9							
APR 22 71	THU	6	31.4	28.1	28.1	73.3	55.6			64.5	48.8	135	75	36	36	87	80	60
APR 23 71	FRI	99																
APR 24 71	SAT	99																
APR 25 71	SUN	6	25.5	24.3	24.3	74.1	47.6	89.7	87.6	70.7	60.0	147	56	42	38	74	53	77
APR 26 71	MON	6		21.2	21.2			67.1	57.6	50.5	40.2							
APR 27 71	TUE	6	32.9	39.8	39.8	62.5	69.4	79.8	75.1	67.8	62.6	144	95	66	54	72	62	44
APR 28 71	WED	6																
APR 29 71	THU	6	32.5	27.3	27.3	61.6	54.3	57.5	60.2	56.9	45.7	138	60	57	53	88	78	63
APR 30 71	FRI	99																
MAY 1 71	SAT	99																
MAY 2 71	SUN	6	23.7	19.8	19.8	55.3	39.4	56.1	68.8	31.8	61.8	132	62	165	59	81	86	80
MAY 3 71	MON	6		29.0	29.0			49.7	60.6	59.4	58.6							
MAY 4 71	TUE	6	34.3	30.5	30.5	75.6	57.7	59.5	65.2	56.1	63.3	156	80	153	38	75	56	66
MAY 5 71	WED	99																
MAY 6 71	THU	6	37.9	28.9	28.9	52.4	67.9	57.7	53.6	51.6	64.1	168	65	48	80	88	72	54
MAY 7 71	FRI	99																
MAY 8 71	SAT	99																
MAY 9 71	SUN	6	31.0	29.1	29.1	79.2	59.0	73.9	54.3	71.5	59.3	183	77	150	38		83	75

Date of Obsv	Day of Week	Samp Type	Bod Load 2	Org C Load 1	Org C Load 2	Bod EFF 1	Bod EFF 2	SS EFF 1	SS EFF 2	Org C EFF 1	Org C EFF 2	Inf Bod	P-1 Bod	F-1 Bod	S-1 Bod	P-2 Bod	F-2 Bod	S-2 Bod
MAY 10 71	MON	99																
MAY 11 71	TUE	99																
MAY 12 71	WED	99																
MAY 13 71	THU	99																
MAY 14 71	FRI	99																
MAY 15 71	SAT	99																
MAY 16 71	SUN	6	44.4	38.4	38.4	77.6	60.3	65.1	52.7	59.3	58.5	156	62	47	35	77	69	62
MAY 17 71	MON	6		41.2	41.2			89.8	84.7	62.8	66.9							
MAY 18 71	TUE	6	21.1	52.9	52.9	50.0	42.9	86.5	87.6	64.9	67.3	84	70	35	42	52	82	48
MAY 19 71	WED	99																
MAY 20 71	THU	6	35.3	32.9	32.9	77.6	41.5	92.0	81.1	55.5	55.5	147	92	53	33	72	74	86
MAY 21 71	FRI	99																
MAY 22 71	SAT	99																
MAY 23 71	SUN	6	43.4	29.6	29.6	85.8	66.3	88.6	86.2	64.9	65.5	246	112	48	35	130	75	83
MAY 24 71	MON	6		38.7	38.7					59.8	59.2							
MAY 25 71	TUE	6		33.3	33.3			94.0	93.3	61.7	58.0							
MAY 26 71	WED	6		31.1	31.1			89.7	89.7	67.3	63.2							
MAY 27 71	THU	6	27.6	27.1	27.1	67.9	76.9	85.6	74.2	68.0	57.5	156	68	32	50	57	38	36
MAY 28 71	FRI	99																
MAY 29 71	SAT	99																
MAY 30 71	SUN	99																
MAY 31 71	MON	6		17.6	17.6			86.2	81.6	64.0	57.0							
JUN 1 71	TUE	6	23.0	32.4	32.4	95.1	88.6	93.4	92.8	76.3	69.9	123	29	17	6	39	32	14
JUN 2 71	WED	6		34.5	34.5			88.7	90.9	68.8	66.1							
JUN 3 71	THU	6	23.6	31.6	31.6	91.7	91.7	91.0	68.7	72.9	69.5	132	41	20	11	3	0	11
JUN 4 71	FRI	99																
JUN 5 71	SAT	99																
JUN 6 71	SUN	6		20.1	20.1			81.4	81.4	71.5	72.3							
JUN 7 71	MON	6		25.7	25.7					66.4	65.6							
JUN 8 71	TUE	6	35.9	20.1	20.1	61.3				59.6	54.8	186	70	53	72	66	69	
JUN 9 71	WED	6		24.1	24.1					65.1	67.5							
JUN 10 71	THU	6	29.5	26.9	26.9	78.8	85.3	83.5	87.1	68.3	61.3	156	60	50	33	57	38	23
JUN 11 71	FRI	99																
JUN 12 71	SAT	99																
JUN 13 71	SUN	6	25.6			80.2	85.2	90.4	87.4			162	47	36	32	42	42	24
JUN 14 71	MON	6						92.9	92.9									
JUN 15 71	TUE	6	25.2			84.8	81.8	85.7	82.7			198	58	39	30	74	59	36
JUN 16 71	WED	6						91.9	92.5									
JUN 17 71	THU	99																
JUN 18 71	FRI	99																
JUN 19 71	SAT	99																
JUN 20 71	SUN	99																
JUN 21 71	MON	99																
JUN 22 71	TUE	6	20.1	16.8	16.8	68.8	62.5	75.3	80.6	45.0	69.2	144	77	57	45	50	26	54
JUN 23 71	WED	99																
JUN 24 71	THU	6	37.8	20.2	20.2	75.0	89.7			59.6	67.9	204	76	41	51	84	35	21
JUN 25 71	FRI	99																
JUN 26 71	SAT	6	16.9	17.6	17.6	75.0	55.6	87.8	90.9	67.9	71.4	108	47	41	27	27	47	48
JUN 27 71	SUN	99																
JUN 28 71	MON	6		13.9	13.9			88.9	90.9	65.5	74.1							
JUN 29 71	TUE	6	25.5	18.8	18.8	75.0	87.5			51.9	67.9	144	53	71	36	39	27	18
JUN 30 71	WED	6		21.7	21.7			83.5	87.6	63.7	69.0							
JUL 1 71	THU	6		22.8	22.8					54.4	59.6							

Date of Obsv	Day of Week	Samp Type	Bod Load 2	Org C Load 1	Org C Load 2	Bod EFF 1	Bod EFF 2	SS EFF 1	SS EFF 2	Org C EFF 1	Org C EFF 2	Inf Bod	P-1 Bod	F-1 Bod	S-1 Bod	P-2 Bod	F-2 Bod	S-2 Bod
JUL 2 71	FRI	99																
JUL 3 71	SAT	99																
JUL 4 71	SUN	99																
JUL 5 71	MON	6		19.4	19.4			86.3	90.9	71.4	75.6							
JUL 6 71	TUE	6	22.5	20.4	20.4	86.8	92.1	86.0	76.2	71.8	65.0	114	63	26	15	21	18	9
JUL 7 71	WED	6		25.0	25.0					73.7	64.7							
JUL 8 71	THU	6	21.9	23.4	23.4	81.6	54.4	73.9	75.4	64.8	66.4	114	32	20	21	29	56	52
JUL 9 71	FRI	99																
JUL 10 71	SAT	6	20.4	17.4	17.4	82.6	53.0	87.3	92.1	68.1	69.9	132	63	29	23	35	32	62
JUL 11 71	SUN	99																
JUL 12 71	MON	6		12.0	12.0			92.1	90.4	48.5	50.0							
JUL 13 71	TUE	6		21.1	21.1			82.9	73.3	72.6	69.2							
JUL 14 71	WED	6		21.0	21.0			93.3	94.8	72.9	75.4							
JUL 15 71	THU	6	35.3	22.5	22.5	85.4	80.3	89.5	94.4	72.2	77.8	198	100	50	29	44	32	39
JUL 16 71	FRI	99																
JUL 17 71	SAT	6	25.2	18.3	18.3	82.1	91.1	89.9	90.6	69.7	77.0	168	81	51	30	38	45	15
JUL 18 71	SUN	99																
JUL 19 71	MON	6		25.6	25.6			94.0	94.0	79.7	81.8							
JUL 20 71	TUE	6	21.3	22.1	22.1	90.0	75.0	90.8	93.5	75.2	76.0	120	48	15	12	20	11	30
JUL 21 71	WED	6		20.3	20.3			94.7	94.7	80.7	77.2							
JUL 22 71	THU	6	27.2	19.4	19.4	94.1	68.6	92.6	92.0	74.3	75.2	153	92	18	9	50	8	48
JUL 23 71	FRI	99																
JUL 24 71	SAT	6	12.0	22.2	22.2	92.6	80.2	94.0	89.0	76.7	75.3	81	59	15	6	32	14	16
JUL 25 71	SUN	99																
JUL 26 71	MON	6		26.3	26.3			91.6	91.0	73.4	75.5							
JUL 27 71	TUE	6	20.0	24.6	24.6	73.7	90.4	77.2	83.7	66.4	77.9	114	63	74	30	39	32	11
JUL 28 71	WED	6		23.4	23.4			94.5	94.7	66.2	75.2							
JUL 29 71	THU	6	32.8	22.2	22.2	88.3	84.8			58.6	79.3	171	102	33	20	27	15	26
JUL 30 71	FRI	99																
JUL 31 71	SAT	99																
AUG 1 71	SUN	99																
AUG 2 71	MON	6		20.8	20.8			76.0	92.5	38.4	75.8							
AUG 3 71	TUE	6	23.4	23.4	23.4	73.7	88.6	88.9	91.4	68.4	76.3	114	77	21	30	54	51	13
AUG 4 71	WED	6		19.0	19.0			94.3	89.9	74.2	83.1							
AUG 5 71	THU	6	19.1	20.9	20.9	88.5	93.8	88.5	77.9	63.8	69.5	96	78	8	11	24	35	6
AUG 6 71	FRI	99																
AUG 7 71	SAT	99																
AUG 8 71	SUN	99																
AUG 9 71	MON	6		30.2	30.2			86.4	93.5	74.7	81.8							
AUG 10 71	TUE	6	21.3	24.5	24.5	86.4	87.8	92.4	93.5	75.7	76.3	147	55	13	20	30	27	18
AUG 11 71	WED	6		24.9	24.9			91.9	91.9	64.6	71.5							
AUG 12 71	THU	6	30.9	25.9	25.9	81.5	88.1	79.2	86.7	74.5	79.4	168	95	53	31	42	50	20
AUG 13 71	FRI	99																
AUG 14 71	SAT	6	15.0	15.6	15.6	88.5	76.0	74.3	70.6	67.0	70.0	96	62	30	11	20	32	23
AUG 15 71	SUN	99																
AUG 16 71	MON	6		22.9	22.9			91.3	89.6	79.4	77.1							
AUG 17 71	TUE	6	35.5	20.9	20.9	59.0	87.5	89.5	90.9	70.6	68.2	144	77	21	59	74		18
AUG 18 71	WED	6		20.6	20.6					57.6	69.6							
AUG 19 71	THU	6	27.3	20.1	20.1	75.0	86.8	84.9	90.4	75.5	70.8	144	74	71	36	72	32	19
AUG 20 71	FRI	99																
AUG 21 71	SAT	6		14.6	14.6			92.5		77.0								
AUG 22 71	SUN	99																
AUG 23 71	MON	6		28.1	28.1			89.8	79.6	80.5	73.8							

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Date of Obsv	Day of Week	Samp Type	Bod Load 2	Org C Load 1	Org C Load 2	Bod EFF 1	Bod EFF 2	SS EFF 1	SS EFF 2	Org C EFF 1	Org C EFF 2	Inf Bod	P-1 Bod	F-1 Bod	S-1 Bod	P-2 Bod	F-2 Bod	S-2 Bod
AUG 24 71	TUE	6	25.0	28.9	28.9	90.0	88.3	94.0	94.0	71.2	69.8	120	57	23	12	26	42	14
AUG 25 71	WED	6		7.1	7.1					77.9	76.2							
AUG 26 71	THU	6	14.6	13.8	13.8	85.0	88.9	91.3	87.7	77.2	75.9	153	89	35	23	81	57	17
AUG 27 71	FRI	99																
AUG 28 71	SAT	6	2.2	3.0	3.0	87.1	93.2	79.1	92.7	81.6	78.2	132	78	27	17	27	59	9
AUG 29 71	SUN	99																
AUG 30 71	MON	6		23.7	23.7			83.6	87.1	77.2	75.4							
AUG 31 71	TUE	6	13.6	13.4	13.4	81.8	87.4	51.3	80.8	76.3	77.6	159	90	36	29	83	29	20
SEP 1 71	WED	6		36.1	36.1			83.5	80.9	85.7	81.1							
SEP 2 71	THU	6	80.4	37.8	37.8	64.0	64.7	79.4	63.6	66.0	61.0	300	114	92	108	120	104	106
SEP 3 71	FRI	99																
SEP 4 71	SAT	99																
SEP 5 71	SUN	99																
SEP 6 71	MON	99																
SEP 7 71	TUE	6	52.5	34.2	34.2	81.1	82.1			71.8	58.0	201	74	51	38	100	42	36
SEP 8 71	WED	6		41.0	41.0			87.2	71.6	74.5	64.7							
SEP 9 71	THU	6	51.5	57.9	57.9	84.4	82.8			77.8	78.7	192	72	35	30	96		33
SEP 10 71	FRI	99																
SEP 11 71	SAT	6	40.1	41.5	41.5	81.3	63.2	82.2	71.2	70.5	52.3	144	56	53	27	83	92	53
SEP 12 71	SUN	99																
SEP 13 71	MON	6		45.7	45.7			48.1	82.1	51.1	74.1							
SEP 14 71	TUE	99																
SEP 15 71	WED	6		43.7	43.7			60.7	72.6	64.1	68.0							
SEP 16 71	THU	6	47.4	36.0	36.0		84.2	82.1	83.4	63.1	60.8	171	100			102	38	27
SEP 17 71	FRI	99																
SEP 18 71	SAT	6	30.4	28.8	28.8	79.5	86.4	89.5	83.6	72.0	67.2	132	75	29	27	33	59	18
SEP 19 71	SUN	99																
SEP 20 71	MON	6		54.3	54.3			84.1	81.9	76.9	76.4							
SEP 21 71	TUE	6	54.0	40.2	40.2		79.5	79.1	77.4	68.1	63.8	156	48	44		63	57	32
SEP 22 71	WED	6		30.8	30.8			84.8	75.9	72.4	66.3							
SEP 23 71	THU	6	55.3	32.3	32.3	85.2	70.5	88.6	80.4	71.0	63.6	183	54	42	27	128		54
SEP 24 71	FRI	99																
SEP 25 71	SAT	6	60.5	29.7	29.7	85.9	83.3	88.8	77.6	74.8	70.4	234	63	27	33	74		39
SEP 26 71	SUN	99																
SEP 27 71	MON	6		32.9	32.9													
SEP 28 71	TUE	99																
SEP 29 71	WED	99																
SEP 30 71	THU	6	49.0	35.9	35.9	75.8	85.5	66.3	82.1	66.9	75.2	165	59	20	40	92	59	24
OCT 1 71	FRI	99																
OCT 2 71	SAT	6	53.5	28.6	28.6	89.9	88.1	78.5	71.0	72.9	69.4	159	44		16	50	16	19
OCT 3 71	SUN	99																
OCT 4 71	MON	6		38.7	38.7			66.4	80.0	74.8	81.9							
OCT 5 71	TUE	6	55.1	46.1	46.1	82.4	60.4	81.5	82.1	75.9	76.7	159	77	47	28	126	84	63
OCT 6 71	WED	6		31.6	31.6			72.4	87.9	56.6	67.5							
OCT 7 71	THU	99																
OCT 8 71	FRI	99																
OCT 9 71	SAT	99																
OCT 10 71	SUN	6	26.6	26.6	26.6	-1.4	75.0			38.9	56.9	72	32	18	73	50	80	18
OCT 11 71	MON	6		46.5	46.5			71.3	69.7	74.1	82.7							
OCT 12 71	TUE	6	55.1	32.0	32.0	56.3	75.9	15.6	79.2	40.6	70.3	174	44	33	76	75	71	42
OCT 13 71	WED	6		38.7	38.7			85.3	79.7	72.7	70.3							
OCT 14 71	THU	6	53.5	35.1	35.1	55.6	88.3	48.6	69.4	49.2	67.8	180	83	42	80	92	62	21
OCT 15 71	FRI	99																

Date of Obsv	Day of Week	Samp Type	Bod Load 2	Org C Load 1	Org C Load 2	Bod EFF 1	Bod EFF 2	SS EFF 1	SS EFF 2	Org C EFF 1	Org C EFF 2	Inf Bod	P-1 Bod	F-1 Bod	S-1 Bod	P-2 Bod	F-2 Bod	S-2 Bod
OCT 16 71	SAT	6	21.9	26.3	26.3	4.3	45.2	86.3	81.4	69.6	71.4	93	48	45	89	77	56	51
OCT 17 71	SUN	99																
OCT 18 71	MON	6		39.7	39.7			67.2	77.6	61.5	67.8							
OCT 19 71	TUE	6		38.9	38.9			68.3	74.2	65.7	70.1							
OCT 20 71	WED	6		38.8	38.8			60.4	75.0	64.7	72.1							
OCT 21 71	THU	6	46.4	39.9	39.9	81.4	86.4	76.1	84.3	69.1	75.0	177	56	29	33	69	65	24
OCT 22 71	FRI	99																
OCT 23 71	SAT	6	39.4	20.7	20.7	71.4	88.6	79.6	73.5	21.8	50.9	105	32	30	30	53	12	12
OCT 24 71	SUN	99																
OCT 25 71	MON	99																
OCT 26 71	TUE	99																
OCT 27 71	WED	99																
OCT 28 71	THU	99																
OCT 29 71	FRI	99																
OCT 30 71	SAT	99																
OCT 31 71	SUN	99																
NOV 1 71	MON	6		43.4	43.4			83.5	75.0	61.0	61.6							
NOV 2 71	TUE	6	45.2	42.0	42.0	73.2	72.5	78.0	78.0	61.3	56.3	153	72	69	41	72	45	42
NOV 3 71	WED	6		58.4	58.4					64.5	64.5							
NOV 4 71	THU	99																
NOV 5 71	FRI	99																
NOV 6 71	SAT	99																
NOV 7 71	SUN	99																
NOV 8 71	MON	99																
NOV 9 71	TUE	99																
NOV 10 71	WED	6		51.8	51.8			71.4	76.6	64.7	62.2							
NOV 11 71	THU	6	44.9	39.2	39.2	70.9	65.5	69.6	60.2	54.2	61.1	165	72	53	48	90	42	57
NOV 12 71	FRI	99																
NOV 13 71	SAT	6	40.3	34.4	34.4	66.7	85.5	80.2	83.1	72.3	68.6	186	96	53	62	83	39	27
NOV 14 71	SUN	99																
NOV 15 71	MON	6		50.6	50.6			84.0	68.9	61.3	58.1							
NOV 16 71	TUE	6	47.0	49.3	49.3	65.0	76.3	85.0	82.1	64.0	68.3	177	56	47	62	81	47	42
NOV 17 71	WED	6		57.6	57.6			79.4	77.4	71.0	74.7							
NOV 18 71	THU	6	44.0	38.7	38.7	76.4	76.4	82.8	90.2	63.4	62.1	165	62	54	39	84	44	39
NOV 19 71	FRI	99																
NOV 20 71	SAT	6		29.8	29.8			85.1	72.3	76.7	70.5							
NOV 21 71	SUN	99																
NOV 22 71	MON	6		36.3	36.3			81.6	83.7	64.3	69.3							
NOV 23 71	TUE	6		30.2	30.2				71.5		66.9							
NOV 24 71	WED	99																
NOV 25 71	THU	99																
NOV 26 71	FRI	99																
NOV 27 71	SAT	6	39.2	14.6	14.6	67.8	81.6		75.6		60.0	174	66	54	56	75	36	32
NOV 28 71	SUN	99																
NOV 29 71	MON	6		42.8	42.8			84.2	77.4	74.0	68.7							
NOV 30 71	TUE	15		40.1	40.1			83.6	72.7	78.5	72.9							
DEC 1 71	WED	15		38.0	38.0					70.7	70.7							
DEC 2 71	THU	15	48.3	36.7	36.7	76.7	78.9	75.7	69.6	70.8	70.8	180	81	32	42	86	48	38
DEC 3 71	FRI	99																
DEC 4 71	SAT	15	45.7	36.9	36.9	71.8	73.4	90.2	84.7	73.4	67.1	177	71	59	50	81		47
DEC 5 71	SUN	99																
DEC 6 71	MON	15		49.0	49.0			86.5	71.8	77.5	71.3							
DEC 7 71	TUE	15	44.4	38.9	38.9	77.1	70.6	86.4	77.7	73.1	70.9	153	74	60	35	87	75	45

Date of Obsv	Day of Week	Samp Type	Bod Load 2	Org C Load 1	Org C Load 2	Bod EFF 1	Bod EFF 2	SS EFF 1	SS EFF 2	Org C EFF 1	Org C EFF 2	Inf Bod	P-1 Bod	F-1 Bod	S-1 Bod	P-2 Bod	F-2 Bod	S-2 Bod
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DEC 8 71	WED	15		49.1	49.1			78.4	79.7	77.0	75.9							
DEC 9 71	THU	15	51.3	39.9	39.9	79.3	69.7	82.6	74.9	72.7	66.2	198	89	87	41	99	86	60
DEC 10 71	FRI	99																
DEC 11 71	SAT	15	41.1	30.7	30.7	65.1		80.3		62.3		195	87	80	68	81	74	
DEC 12 71	SUN	99																
DEC 13 71	MON	15		49.9	49.9			70.8	76.8	68.2	75.3							
DEC 14 71	TUE	15		34.9	34.9			76.3	72.6	66.2	57.0							
DEC 15 71	WED	15	50.5	38.0	38.0	71.4	67.6	71.7	71.3	67.7	66.5	210	86	93	60	106	56	68
DEC 17 71	FRI	99																
DEC 18 71	SAT	15		30.5	30.5			76.7	82.7	68.9	66.2							
DEC 19 71	SUN	99																
DEC 20 71	MON	15		27.0	27.0			78.8	67.2	62.2	58.6							
DEC 21 71	TUE	99																
DEC 22 71	WED	99																
DEC 23 71	THU	99																
DEC 24 71	FRI	99																
DEC 25 71	SAT	99																
DEC 26 71	SUN	99																
DEC 27 71	MON	99																
DEC 28 71	TUE	15	21.6	18.9	18.9	84.0	76.0	82.8	68.2	71.0	64.9	150	47	30	24	53	47	36
DEC 29 71	WED	15		13.8	13.8			65.6	79.0	45.2	48.4							
DEC 30 71	THU	15	31.5	28.7	28.7	84.3	79.9	85.1	68.2	78.0	73.7	204	71	35	32	74	50	41
DEC 31 71	FRI	99																
JAN 1 72	SAT	99																
JAN 2 72	SUN	99																
JAN 3 72	MON	15		29.4	29.4			89.9	71.9	75.9	64.7							
JAN 4 72	TUE	15	32.4	24.0	24.0	83.1	84.7	88.9	88.4	65.0	69.3	189	54	42	32	71	35	29
JAN 5 72	WED	15		15.2	15.2			87.4	85.7	47.7	50.0							
JAN 6 72	THU	15	34.2	27.1	27.1	67.7	80.2	44.0	81.8	51.3	65.1	192	69	38	62	71	32	36
JAN 7 72	FRI	99																
JAN 8 72	SAT	15		12.3	12.3													
JAN 9 72	SUN	99																
JAN 10 72	MON	15		41.1	41.1			36.8	48.3	66.2	68.3							
JAN 11 72	TUE	15	27.7	22.2	22.2	75.0	72.9	58.1	79.7	57.1	53.2	96	51		24	41	26	26
JAN 12 72	WED	15		37.9	37.9			-9.3	47.0	66.9	63.3							
JAN 13 72	THU	99																
JAN 14 72	FRI	99																
JAN 15 72	SAT	15	32.6	23.2	23.2	54.3	58.7	37.2	-1.8	53.1	45.9	138	75	89	63	86	44	57
JAN 16 72	SUN	99																
JAN 17 72	MON	15		32.1	32.1			57.8	68.6	52.2	53.7							
JAN 18 72	TUE	15	43.4	38.0	38.0	78.5	64.4	86.5	62.9	74.2	65.2	177	78	74	38	78	75	63
JAN 19 72	WED	15		40.3	40.3			91.8	90.0	65.8	57.8							
JAN 20 72	THU	15	49.1	53.7	53.7	67.2	58.7	40.1	64.1	72.0	65.2	189	102	98	62	130	108	78
JAN 21 72	FRI	99																
JAN 22 72	SAT	15	41.3	27.2	27.2	74.6	62.4	85.0	71.7	69.7	55.5	181	84	72	46	94	92	68
JAN 23 72	SUN	99																
JAN 24 72	MON	15		41.8	41.8			57.2	75.4	46.3	73.8							

Date of Obsv	Day of Week	Samp Type	Inf SS	P-1 SS	F-1 SS	S-1 SS	P-2 SS	F-2 SS	S-2 SS	Inf Org C	P-1 Org C	F-1 Org C	S-1 Org C	P-2 Org C	F-2 Org C	S-2 Org C	Inf NO2	P-1 NO2	F-1 NO2
NOV 19 69	WED	6		93	55	48	108	83	40										
NOV 19 69	WED	4								126	58	33	38	65	43	42			
NOV 20 69	THU	6	246	73	47	37	88	55	49										
NOV 20 69	THU	4								126	58	33	38	65	43	42			
NOV 21 69	FRI	6	176	79	46	51	102	51	56										
NOV 21 69	FRI	7								105	57	58	47	58	68	54	0.05	0.05	0.05
NOV 22 69	SAT	4	171	74	73	44	98	57	58										
NOV 22 69	SAT	7								105	57	58	47	58	68	54	0.05	0.05	0.05
NOV 23 69	SUN	4	171	74	73	44	98	57	58										
NOV 23 69	SUN	7								105	57	58	47	58	68	54	0.05	0.05	0.05
NOV 24 69	MON	6	209	83	50	64	135	107	65										
NOV 24 69	MON	4								127	60	44	36	103	48	44	0.05	0.05	0.10
NOV 25 69	TUE	6	133	11	8	10	87	42	9										
NOV 25 69	TUE	4								127	60	44	36	103	48	44	0.05	0.05	0.10
NOV 26 69	WED																		
NOV 27 69	THU																		
NOV 28 69	FRI																		
NOV 29 69	SAT	4	180	52	23	45	87	42	33	102	31	35	44	41	45	37	0.05	0.18	0.26
NOV 30 69	SUN	4	180	52	23	45	87	42	33	102	31	35	44	41	45	37	0.05	0.18	0.26
DEC 1 69	MON	6	207	88	49	46	119	73	45										
DEC 1 69	MON	4								114	62	42	47	81	57	49	0.05	0.06	0.12
DEC 2 69	TUE	6	155	58	37	39	96	57	47										
DEC 2 69	TUE	4								114	62	42	47	81	57	49	0.05	0.06	0.12
DEC 3 69	WED	6	132	36	14	14	74	29	19										
DEC 3 69	WED	4								102	49	32	38	49	37	48	0.05	0.05	0.10
DEC 4 69	THU	6	199	48	28	43	86	47	43										
DEC 4 69	THU	4								102	49	32	38	49	37	48	0.05	0.05	0.10
DEC 5 69	FRI	6	171	53	24	25	82	47	34										
DEC 5 69	FRI	7								98	47	38	35	57	40	33	0.05	0.05	0.09
DEC 6 69	SAT	4	126	75	53	41	47	27	31										
DEC 6 69	SAT	7								98	47	38	35	57	40	33	0.05	0.05	0.09
DEC 7 69	SUN	4	126	75	53	41	47	27	31										
DEC 7 69	SUN	7								98	47	38	35	57	40	33	0.05	0.05	0.09
DEC 8 69	MON	6	209	77	51	43	135	100	96										
DEC 8 69	MON	4								115	59	44	56	75	47	48	0.05	0.05	0.10
DEC 9 69	TUE	6	186	62	36	39	88	51	39										
DEC 9 69	TUE	4								115	59	44	56	75	47	48	0.05	0.05	0.10
DEC 10 69	WED	6	176	80	8	30	90	38	26										
DEC 10 69	WED	4								107	53	32	37	53	41	34	0.05	0.05	0.09
DEC 11 69	THU	6	139	22	1	9	19	11	9										
DEC 11 69	THU	4								107	53	32	37	53	41	34	0.05	0.05	0.09
DEC 12 69	FRI	7								109	47	44	43	55	45	33	0.05	0.05	0.05
DEC 12 69	FRI	6	168	45	31	21	67	42	32										
DEC 13 69	SAT	7								109	47	44	43	55	45	33	0.05	0.05	0.05
DEC 13 69	SAT	4	137	46	20	26	64	38	23										
DEC 14 69	SUN	7								109	47	44	43	55	45	33	0.05	0.05	0.05
DEC 14 69	SUN	4	137	46	20	26	64	38	23										
DEC 15 69	MON	4																	
DEC 15 69	MON	6	222	62	36	42	101	51	23										
DEC 16 69	TUE	6	178	88	56	56	72	53	38										
DEC 16 69	TUE	4																	
DEC 17 69	WED	6	169	73	43	37	67	58	40										
DEC 17 69	WED	4																	

Date of Obsv	Day of Week	Samp Type	Inf SS	P-1 SS	F-1 SS	S-1 SS	P-2 SS	F-2 SS	S-2 SS	Inf Org C	P-1 Org C	F-1 Org C	S-1 Org C	P-2 Org C	F-2 Org C	S-2 Org C	Inf NO2	P-1 NO2	F-1 NO2
DEC 18 69	THU	6	153	51	53	34	43	46	19										
DEC 18 69	THU	4																	
DEC 19 69	FRI																		
DEC 20 69	SAT																		
DEC 21 69	SUN																		
DEC 22 69	MON																		
DEC 23 69	TUE																		
DEC 24 69	WED																		
DEC 25 69	THU																		
DEC 26 69	FRI																		
DEC 27 69	SAT																		
DEC 28 69	SUN																		
DEC 29 69	MON	6	143	30		17	68	20	18										
DEC 29 69	MON	4																	
DEC 30 69	TUE	6	49	59		28	87	40	27										
DEC 30 69	TUE	4																	
JAN 1 70	THU																		
JAN 2 70	FRI																		
JAN 5 70	MON																		
JAN 6 70	TUE																		
JAN 7 70	WED																		
JAN 8 70	THU																		
JAN 9 70	FRI																		
JAN 10 70	SAT																		
JAN 11 70	SUN																		
JAN 12 70	MON																		
JAN 13 70	TUE																		
JAN 14 70	WED																		
JAN 15 70	THU																		
JAN 16 70	FRI																		
JAN 17 70	SAT	4	198	85	74	30	84	53	38										
JAN 18 70	SUN	4	198	85	74	30	84	53	38										
JAN 19 70	MON	4	189	61	57	30	67	47	30	141	65	53	45	76	59	48	0.30	0.30	0.30
JAN 20 70	TUE	4	189	61	57	30	67	47	30	141	65	53	45	76	59	48	0.30	0.30	0.30
JAN 21 70	WED	4	157	51	33	24	59	40	36	143	62	45	47	82	52	49	0.30	0.30	0.30
JAN 22 70	THU	4	157	51	33	24	59	40	36	143	62	45	47	82	52	49	0.30	0.30	0.30
JAN 23 70	FRI	7	104	39	50	30	42	56	30	139	39	52	42	50	54	46	0.30	0.30	0.30
JAN 24 70	SAT	7	104	39	50	30	42	56	30	139	39	52	42	50	54	46	0.30	0.30	0.30
JAN 25 70	SUN	7	104	39	50	30	42	56	30	139	39	52	42	50	54	46	0.30	0.30	0.30
JAN 26 70	MON	4	224	53	69	18	91	71	27	135	61	57	34	72	51	41	0.30	0.30	0.30
JAN 27 70	TUE	4	224	53	69	18	91	71	27	135	61	57	34	72	51	41	0.30	0.30	0.30
JAN 28 70	WED	4	257	64	162	56	61	69	30	154	66	91	46	59	60	43	0.30	0.30	0.30
JAN 29 70	THU	4	257	64	162	56	61	69	30	154	66	91	46	59	60	43	0.30	0.30	0.30
JAN 30 70	FRI	7	111	40	38	15	43	51	27	121	51	40	31	58	54	45	0.30	0.30	0.30
JAN 31 70	SAT	7	111	40	38	15	43	51	27	121	51	40	31	58	54	45	0.30	0.30	0.30
FEB 1 70	SUN	7	111	40	38	15	43	51	27	121	51	40	31	58	54	45	0.30	0.30	0.30
FEB 2 70	MON	4								116	40	30	25	58	39	36	0.30	0.30	0.30
FEB 3 70	TUE	4								116	40	30	25	58	39	36	0.30	0.30	0.30
FEB 4 70	WED	4	106	52	31	50	107	49	38	87	56	37	50	80	48	47	0.30	0.30	0.30
FEB 5 70	THU	4	106	52	31	50	107	49	38	87	56	37	50	80	48	47	0.30	0.30	0.30
FEB 6 70	FRI																		
FEB 7 70	SAT	4	210	73	53	37	108	69	47	104	56	49	43	75	59	53	0.30	0.30	0.30
FEB 8 70	SUN	4	210	73	53	37	108	69	47	104	56	49	43	75	59	53	0.30	0.30	0.30

Date of Obsv	Day of Week	Samp Type	Inf SS	P-1 SS	F-1 SS	S-1 SS	P-2 SS	F-2 SS	S-2 SS	Inf Org C	P-1 Org C	F-1 Org C	S-1 Org C	P-2 Org C	F-2 Org C	S-2 Org C	Inf NO2	P-1 NO2	F-1 NO2
FEB 9 70	MON	4	147	36	64	33	90	63	45	115	51	51	41	75	60	52	0.30	0.30	0.30
FEB 10 70	TUE	4	147	36	64	33	90	63	45	115	51	51	41	75	60	52	0.30	0.30	0.30
FEB 11 70	WED	4	232	72	72	48	127	92	104	139	65	57	49	85	66	69	0.30	0.30	0.30
FEB 12 70	THU	4	232	72	72	48	127	92	104	139	65	57	49	85	66	69	0.30	0.30	0.30
FEB 13 70	FRI	7	168	39	85	31	100	89	60	119	57	58	39	68	63	58	0.30	0.30	0.30
FEB 14 70	SAT	7	168	39	85	31	100	89	60	119	57	58	39	68	63	58	0.30	0.30	0.30
FEB 15 70	SUN	7	168	39	85	31	100	89	60	119	57	58	39	68	63	58	0.30	0.30	0.30
FEB 16 70	MON	4	192	84	66	54	120	68	62	126	60	47	43	65	56	50	0.30	0.30	0.30
FEB 17 70	TUE	4	192	84	66	54	120	68	62	126	60	47	43	65	56	50	0.30	0.30	0.30
FEB 18 70	WED	4	165	79	60	32	111	62	56	120	58	47	47	72	51	46	0.30	0.30	0.30
FEB 19 70	THU	4	165	79	60	32	111	62	56	120	58	47	47	72	51	46	0.30	0.30	0.30
FEB 20 70	FRI	7	215	48	23	41	77	58	53	137	55	38	38	65	55	49	0.30	0.30	0.30
FEB 21 70	SAT	7	215	48	23	41	77	58	53	137	55	38	38	65	55	49	0.30	0.30	0.30
FEB 22 70	SUN	7	215	48	23	41	77	58	53	137	55	38	38	65	55	49	0.30	0.30	0.30
FEB 23 70	MON	4	191	75	58	44	111	115	65	151	65	56	51	81	83	67	0.30	0.30	0.30
FEB 24 70	TUE	4	191	75	58	44	111	115	65	151	65	56	51	81	83	67	0.30	0.30	0.30
FEB 25 70	WED	4	247	40	37	20	67	54	56	146	55	49	37	66	66	54	0.30	0.30	0.30
FEB 26 70	THU	4	247	40	37	20	67	54	56	146	55	49	37	66	66	54	0.30	0.30	0.30
FEB 27 70	FRI																		
FEB 28 70	SAT																		
MAR 1 70	SUN																		
MAR 2 70	MON	4	310	66	71	62	129	129	97	179	69	60	55	94	71	70	0.30	0.30	0.30
MAR 3 70	TUE	4	310	66	71	62	129	129	97	179	69	60	55	94	71	70	0.30	0.30	0.30
MAR 4 70	WED	4	99	48	69	28	87	42	40	108	51	55	40	67	53	45	0.30	0.30	0.30
MAR 5 70	THU	4	99	48	69	28	87	42	40	108	51	55	40	67	53	45	0.30	0.30	0.30
MAR 6 70	FRI	7	123	42	33	22	71	62	24	112	48	39	12	69	50	41	0.30	0.30	0.30
MAR 7 70	SAT	7	123	42	33	22	71	62	24	112	48	39	12	69	50	41	0.30	0.30	0.30
MAR 8 70	SUN	7	123	42	33	22	71	62	24	112	48	39	12	69	50	41	0.30	0.30	0.30
MAR 9 70	MON	4	156	59	44	30	83	98	51	128	59	49	41	58	66	62	0.30	0.30	0.30
MAR 10 70	TUE	4	156	59	44	30	83	98	51	128	59	49	41	58	66	62	0.30	0.30	0.30
MAR 11 70	WED	4	148	55	42	27	90	71	37	90	56	48	43	67	59	52	0.30	0.30	0.30
MAR 12 70	THU	4	148	55	42	27	90	71	37	90	56	48	43	67	59	52	0.30	0.30	0.30
MAR 13 70	FRI	4	114	36	36	23	90	57	37	108	43	37	32	67	56	40	0.30	0.30	0.30
MAR 14 70	SAT	4	114	36	36	23	90	57	37	108	43	37	32	67	56	40	0.30	0.30	0.30
MAR 15 70	SUN																		
MAR 16 70	MON	4	194	66	60	30	91	90	65	140	60	55	39	106	70	58	0.30	0.30	0.30
MAR 17 70	TUE	4	194	66	60	30	91	90	65	140	60	55	39	106	70	58	0.30	0.30	0.30
MAR 18 70	WED	4	176	70	102	59	138	119	97	118	52	58	46	73	74	57	0.30	0.30	0.30
MAR 19 70	THU	4	176	70	102	59	138	119	97	118	52	58	46	73	74	57	0.30	0.30	0.30
MAR 20 70	FRI																		
MAR 21 70	SAT																		
MAR 22 70	SUN																		
MAR 23 70	MON	4	121	79	75	63	137	201	136	109	61	52	40	115	113	85	0.30	0.30	0.30
MAR 24 70	TUE	4	121	79	75	63	137	201	136	109	61	52	40	115	113	85	0.30	0.30	0.30
MAR 25 70	WED	4	220	129	236	624	160	148	98	91	65	91	34	84	72	64	0.05	0.05	0.05
MAR 26 70	THU	4	220	129	236	624	160	148	98	91	65	91	34	84	72	64	0.05	0.05	0.05
MAR 27 70	FRI																		
MAR 28 70	SAT																		
MAR 29 70	SUN																		
MAR 30 70	MON	4	140	75	45	58	108	71	64	99	54	48	49	78	71	59	0.30	0.30	0.30
MAR 31 70	TUE	4	140	75	45	58	108	71	64	99	54	48	49	78	71	59	0.30	0.30	0.30
APR 1 70	WED																		
APR 2 70	THU																		

Date of Obsv	Day of Week	Samp Type	Inf SS	P-1 SS	F-1 SS	S-1 SS	P-2 SS	F-2 SS	S-2 SS	Inf Org C	P-1 Org C	F-1 Org C	S-1 Org C	P-2 Org C	F-2 Org C	S-2 Org C	Inf NO2	P-1 NO2	F-1 NO2
APR 3 70	FRI	7	100	48	47	26	84	104	54	105	60	45	32	73	77	59	0.30	0.30	0.30
APR 4 70	SAT	7	100	48	47	26	84	104	54	105	60	45	32	73	77	59	0.30	0.30	0.30
APR 5 70	SUN	7	100	48	47	26	84	104	54	105	60	45	32	73	77	59	0.30	0.30	0.30
APR 6 70	MON	4	145	44	159	28	105	84	54	107	62	72	42	73	70	62	0.30	0.30	0.30
APR 7 70	TUE	4	145	44	159	28	105	84	54	107	62	72	42	73	70	62	0.30	0.30	0.30
APR 8 70	WED	4	122	68	51	27	121	86	72	114	65	43	46	86	76	66			
APR 9 70	THU	4	122	68	51	27	121	86	72	114	65	43	46	86	76	66			
APR 10 70	FRI	7																	
APR 11 70	SAT	7																	
APR 12 70	SUN	7																	
APR 13 70	MON																		
APR 14 70	TUE																		
APR 15 70	WED	4	176				125	72	104	112				84	85	67	0.30		
APR 16 70	THU	4	176				125	72	104	112				84	85	67	0.30		
APR 17 70	FRI	7	146				92	177	91	89				61	81	69	0.30		
APR 18 70	SAT	7	146				92	177	91	89				61	81	69	0.30		
APR 19 70	SUN	7	146				92	177	91	89				61	81	69	0.30		
APR 20 70	MON																		
APR 21 70	TUE																		
APR 22 70	WED																		
APR 23 70	THU																		
APR 24 70	FRI	7	207				89	101	74	128				78	74	56	0.30		
APR 25 70	SAT	7	207				89	101	74	128				78	74	56	0.30		
APR 26 70	SUN	7	207				89	101	74	128				78	74	56	0.30		
APR 27 70	MON	4																	
APR 28 70	TUE	4																	
APR 29 70	WED	4																	
APR 30 70	THU	4																	
MAY 1 70	FRI	7	186				64	95	50	110				78	67	51	0.30		
MAY 2 70	SAT	7	186				64	95	50	110				78	67	51	0.30		
MAY 3 70	SUN	7	186				64	95	50	110				78	67	51	0.30		
MAY 4 70	MON																		
MAY 5 70	TUE																		
MAY 6 70	WED	4	401				93	84	30	74				74	68	66	0.30		
MAY 7 70	THU	4	401				93	84	30	74				74	68	66	0.30		
MAY 8 70	FRI																		
MAY 9 70	SAT																		
MAY 10 70	SUN	6	193				72	309	82	98				64	106	52	0.30		
MAY 11 70	MON																		
MAY 12 70	TUE	6	218				109	93	64	117				72	68	63	0.30		
MAY 13 70	WED																		
MAY 14 70	THU																		
MAY 15 70	FRI																		
MAY 16 70	SAT																		
MAY 17 70	SUN	6	98	21	25	3	46	30	7	65	54	45	32	46	35	31	0.30	0.30	0.30
MAY 18 70	MON																		
MAY 19 70	TUE																		
MAY 20 70	WED	6	160	77	42	86	61	63	37	99	44	39	40	56	44	40	0.30	0.30	0.30
MAY 21 70	THU	6	116	13	34	45	48	40	14	115	48	35	37	58	51	36	0.30	0.30	0.30
MAY 22 70	FRI																		
MAY 23 70	SAT																		
MAY 24 70	SUN	6	78	12	20	9	55	24	9	92	36	31	27	52	42	48	0.30	0.30	0.25
MAY 25 70	MON																		

Date of Obsv	Day of Week	Samp Type	Inf SS	P-1 SS	F-1 SS	S-1 SS	P-2 SS	F-2 SS	S-2 SS	Inf Org C	P-1 Org C	F-1 Org C	S-1 Org C	P-2 Org C	F-2 Org C	S-2 Org C	Inf NO2	P-1 NO2	F-1 NO2
MAY 26 70	TUE	6	198	57	67	58	37	132	75	87	42	44	35	55	53	40	0.02	0.25	0.24
MAY 27 70	WED																		
MAY 28 70	THU	6	124	66	66	180	89	92	69	142	45	43	40	58	43	39	0.01	0.46	0.48
MAY 29 70	FRI																		
MAY 30 70	SAT																		
MAY 31 70	SUN	6	104	31	30	22	45	35	19	109	39	37	30	54	42	38	0.01	0.87	0.81
JUN 1 70	MON																		
JUN 2 70	TUE	6	88	12	32	18	40	41	14	113	36	32	29	52	46	34	0.01	0.02	0.72
JUN 3 70	WED																		
JUN 4 70	THU	6	286	48	42	37	97	37	25	129	52	36	34	66	57	46	0.01	0.08	0.70
JUN 5 70	FRI																		
JUN 6 70	SAT																		
JUN 7 70	SUN	6	139	21		28	47	189	13	87	40	34	32	51	55	35	0.01	0.24	0.98
JUN 8 70	MON																		
JUN 9 70	TUE	6	166	64	25	21	61	44	30	78	57	30	39	52	46	40	0.10	0.50	0.70
JUN 10 70	WED	9	201	64	38	27	63		33	114	57	37	46	68		48			
JUN 11 70	THU	9	171	36	12	8	77		18	142	48	34	28	63		39	0.10	0.10	0.50
JUN 12 70	FRI																		
JUN 13 70	SAT																		
JUN 14 70	SUN	6	160	30	31	19	50	57	28	132	49	42	32	65	54	43	0.10	0.33	0.68
JUN 15 70	MON	6	103	32	39	21	99		32	99	49	39	33	78		46			
JUN 16 70	TUE	6	165	39	65	41	85	56	57	126	61	58	42	70	61	61	0.10	0.10	0.27
JUN 17 70	WED	6	269	52	30	26	60	40	45	132	51	38	37	61	42	40			
JUN 18 70	THU	6	154	44	61	25	67	51	40	104	54	44	34	66	46	48	0.01	0.01	0.23
JUN 19 70	FRI																		
JUN 20 70	SAT																		
JUN 21 70	SUN	6	124	38	31	15	47	61	16	105	50	48	39	59	67	44	0.30	0.31	0.03
JUN 22 70	MON	6	153	43	41	40	61	48	36	104	47	48	39	52	52	50			
JUN 23 70	TUE	6	224	46	43	32	68	43	40	121	10	50	39	71	53	49	0.05	0.05	0.30
JUN 24 70	WED	6	157	48	54	25	63		34	134	69	49	39	78		47			
JUN 25 70	THU	6	162	52	40	30	76	131	45	179	70	44	37	72	97	50	0.05	0.05	0.35
JUN 26 70	FRI																		
JUN 27 70	SAT																		
JUN 28 70	SUN	6	161	49	52	42	88	76	51	100	50	39	43	67	66	48	0.05	0.75	0.90
JUN 29 70	MON																		
JUN 30 70	TUE	6	163	23	28	19	70	39	30	104	43	40	35	70	51	41	0.05	0.30	0.55
JUL 1 70	WED	6	131	19	23	15	62	46	22	134	45	34	33	65	69	44			
JUL 2 70	THU	6	126	28	45		64	48	34	125	41	49		57	44	38	0.05	0.05	0.50
JUL 3 70	FRI																		
JUL 4 70	SAT																		
JUL 5 70	SUN	6	128	25	11	9	46	28	13	109	40	29	30	54	35	29	0.01	0.27	0.75
JUL 6 70	MON	6																	
JUL 7 70	TUE	6																	
JUL 8 70	WED	6	136	25	24	14		57	35	102	42	33	30		46	42			
JUL 9 70	THU	6	139	24	29	16	65	35	28	131	45	38	33	62	47	45	0.01	0.07	0.19
JUL 10 70	FRI																		
JUL 11 70	SAT																		
JUL 12 70	SUN	6	132	18	23	11	55	38	18	115	30	26	28	47	43	34	0.01	0.18	0.27
JUL 13 70	MON	6	155	22	17	11	65	39	24	99	34	26	25	52	42	35			
JUL 14 70	TUE	6																	
JUL 15 70	WED																		
JUL 16 70	THU																		
JUL 17 70	FRI																		

Date of Obsv	Day of Week	Samp Type	Inf SS	P-1 SS	F-1 SS	S-1 SS	P-2 SS	F-2 SS	S-2 SS	Inf Org C	P-1 Org C	F-1 Org C	S-1 Org C	P-2 Org C	F-2 Org C	S-2 Org C	Inf NO2	P-1 NO2	F-1 NO2
JUL 18 70	SAT																		
JUL 19 70	SUN	6																	
JUL 20 7C	MON	6																	
JUL 21 70	MON																		
JUL 22 7C	TUE																		
JUL 23 70	THU	6	216	56	43	31	49	60	48	139	63	55	49	49	47	42	0.01	0.01	C.13
JUL 24 70	THU																		
JUL 25 70	FRI																		
JUL 26 70	SUN	6	174	37	60	19	46	41	31	93	46	50	37	44	35	33	0.01	0.01	0.42
JUL 27 70	MON	6	152	41	40	18	44	37	19	148	58	53	41	42	39	31			
JUL 28 70	TUE	6	119	44	45	32	53	99	43	80	72	65	60	72	88	49	0.01	0.01	0.82
JUL 29 70	WED																		
JUL 30 70	THU																		
JUL 31 70	FRI																		
AUG 1 70	SAT																		
AUG 2 70	SUN																		
AUG 3 70	MON																		
AUG 4 7C	TUE																		
AUG 5 70	WED	6	185	38	43	35	54	48	33	113	54	46	41	48	46	39			
AUG 6 70	THU	6	156	37	19	19	41	19	17	100	52	39	40	45	35	33	0.05	C.05	0.15
AUG 7 70	FRI																		
AUG 8 70	SAT																		
AUG 9 70	SUN	6	186	34		20	36		23	116	52		46	48		38	0.05	C.05	
AUG 10 70	MON	6	258	32	26	24	50	46	24	96	39	38	35	43	40	37			
AUG 11 70	TUE																		
AUG 12 70	WED	6	252	44	37	21	40	23	17	109	62	47	42	52	38	38			
AUG 13 70	THU	6	173	46	46	19	47		17	118	59	49	40	50		35	0.01	0.01	0.33
AUG 14 70	FRI																		
AUG 16 70	SUN	6	128	24	22	14	23		13	120	50	45	39	40		30	0.01	0.01	0.29
AUG 17 70	MON	6	322	45	22	14	43	22	10	161	63	44	42	48	37	32			
AUG 18 70	TUE	11	232	39	27	21	35	11	33	159	60	46	33	51	32	39	0.01	0.01	0.32
AUG 19 70	WED																		
AUG 20 70	THU	6	131	37	16	13	28	15	9	115	62	41	40	50	33	33	0.01	0.03	0.20
AUG 21 70	FRI																		
AUG 23 70	SUN																		
AUG 24 70	MON	6	133	29	19	12	29	26	10	87	45	35	31	43	33	29			
AUG 25 70	TUE	6	109	33	10	9	27	13	9	92	47	31	27	37	24	27	0.01	0.05	C.21
AUG 26 70	WED	6	344	57	31	17	43	24	22	141	66	43	39	49	30	34			
AUG 27 70	THU	6	126	46	29	25	39	142	12	97	49	38	36	44	68	26	0.01	0.08	0.1C
AUG 28 70	FRI																		
AUG 29 7C	SAT																		
AUG 30 70	SUN	6	109	37	24	13		21	9	73	50	37	34		32	30	0.02	0.20	0.20
AUG 31 70	MON	6	151	23	13	8	14	8	5	90	47	38	33	43	27	28			
SEP 1 70	TUE	6	235	42	24	12	38	29	12	99	47	34	29	48	32	28	0.01	0.05	0.13
SEP 2 70	WED	6	166	55	37	21	52	29	16	88	64	44	38	62	37	38			
SEP 3 70	THU	6	127		29	12	56	13	20	95	46	54	37	62	33	37	0.02	0.01	0.01
SEP 6 70	SUN																		
SEP 7 70	MON	6	201	39	10	11	65	8	12	188	60	31	29	55	29	28			
SEP 8 70	TUE	6	131	39	24	8	33	31	13	94	53	38	30	54	45	37			
SEP 8 70	TUE	10															0.01	0.01	C.15
SEP 9 70	WED																		
SEP 10 70	THU	6	193	36	21	14	34	21	15	128	47	37	36	55	35	33			
SEP 10 70	THU	10															0.01	0.01	0.15

Date of Obsv	Day of Week	Samp Type	Inf SS	P-1 SS	F-1 SS	S-1 SS	P-2 SS	F-2 SS	S-2 SS	Inf Org C	P-1 Org C	F-1 Org C	S-1 Org C	P-2 Org C	F-2 Org C	S-2 Org C	Inf NO2	P-1 NO2	F-1 NC2
SEP 11 70	FRI																		
SEP 12 70	SAT																		
SEP 13 70	SUN	6	96	36	15	18	46	26	10	94	50	33	33	59	41	38			
SEP 13 70	SUN	12															0.01	0.01	0.12
SEP 14 70	MON	6	88	40	21	12	139	45	20	80	55	31	30	64	44	39			
SEP 15 70	TUE	6	166	39	19	8	42	32		103	61	33	28	66	46				
SEP 15 70	TUE	12															0.01	0.01	0.12
SEP 16 70	WED	6	168	50	38	14	47	37	17	91	59	38	29	67	43	34			
SEP 17 70	THU	12															0.01	0.01	0.12
SEP 17 70	THU	6	144	38	23		49	37	16	151	64	40	40	68	49	43			
SEP 18 70	FRI																		
SEP 19 70	SAT																		
SEP 20 70	SUN	6	103	35	127	11	32	60	14	114	68	23	33	62	61	44			
SEP 20 70	SUN	12															0.01	0.01	0.11
SEP 21 70	MON	6	157	42	29	9	51	46	18	104	61	32	29	64	47	41			
SEP 22 70	TUE	6	190	52	17	12	52	58	18	153	68	41	39	22	63	47			
SEP 22 70	TUE	12															0.01	0.01	0.11
SEP 23 70	WED	6	189	49	57	15	57	79	58	125	51	36	30	56	53	37			
SEP 24 70	THU	12															0.01	0.01	0.11
SEP 24 70	THU	6	143	56	35	14	61	43	30	108	69	38	39	77	47	43			
SEP 25 70	FRI																		
SEP 26 70	SAT																		
SEP 27 70	SUN	6	187	40		18	51	65	21	103	54	43	35	59	59	43			
SEP 27 70	SUN	12															0.01	0.01	0.16
SEP 28 70	MON	6	167	72	31	24	57	27	30	118	71	49	71	73	67	51			
SEP 29 70	TUE	6	142	71	39	17	54	33	30	123	70	44	37	70	54	46			
SEP 29 70	TUE	12															0.01	0.01	0.16
SEP 30 70	WED	6	150		46	17	66	47	26	112	63	50	36	69	50	42			
OCT 1 70	THU	12															0.01	0.01	0.16
OCT 1 70	THU	6	183	54	36	22	73	30	31	116	62	48	42	86	53	51			
OCT 2 70	FRI																		
OCT 3 70	SAT																		
OCT 4 70	SUN	4															0.01	0.70	0.25
OCT 4 70	SUN	13	159	15	18	12	60	71	20	100	40	36	33	63	57	43			
OCT 5 70	MON	6	238	36	21	27	56	106	38	90	52	46	57	71	70	73			
OCT 6 70	TUE	6	113				52	30	46	96				95	85	75			
OCT 6 70	TUE	4															0.01	0.70	0.25
OCT 8 70	THU																		
OCT 7 70	WED																		
OCT 9 70	FRI																		
OCT 10 70	SAT																		
OCT 11 70	SUN																		
OCT 12 70	MON																		
OCT 13 70	TUE																		
OCT 14 70	WED																		
OCT 15 70	THU																		
OCT 16 70	FRI																		
OCT 17 70	SAT																		
OCT 18 70	SUN	6	213	36	41	27	114	364	70	110	35	42	37	79	140	63			
OCT 18 70	SUN	12															0.01	0.32	0.32
OCT 19 70	MON	6	278	42	40	21	126	70	51										
OCT 20 70	TUE	12															0.01	0.32	0.32
OCT 20 70	TUE	6	172	61	29	56	84	55	51										

Date of Obsv	Day of Week	Samp Type	Inf SS	P-1 SS	F-1 SS	S-1 SS	P-2 SS	F-2 SS	S-2 SS	Inf Org C	P-1 Org C	F-1 Org C	S-1 Org C	P-2 Org C	F-2 Org C	S-2 Org C	Inf NO2	P-1 NO2	F-1 NO2
OCT 21 70	WED	6	227	45	30	31	82	54	43										
OCT 22 70	THU	6	142	67	18	33	71	84	41	95	51	36	40	67	72	57			
OCT 22 70	THU	12															0.01	0.32	0.32
OCT 23 70	FRI																		
OCT 24 70	SAT																		
OCT 25 70	SUN	13	188	55	27	20	65	58	38	109	66	59	57	43	33	26			
OCT 25 70	SUN	12															0.01	0.19	0.36
OCT 26 70	MON	6	196	48	24	19	79	50	45	126	60	47	42	83	68	57			
OCT 27 70	TUE	6	170	39	28	25	80	50	30	127	62	57	50	91	68	65			
OCT 27 70	TUE	12															0.01	0.19	0.36
OCT 28 70	WED	6	207	37	29	15	79	50	49	110	47	39	36	71	57	57			
OCT 29 70	THU	6	283	313	362	254	469	441	288	130	135	131	106	206	166	137			
OCT 29 70	THU	12															0.01	0.19	0.36
OCT 30 70	FRI																		
OCT 31 70	SAT																		
NOV 1 70	SUN	6	142	29	31	14	76	66	28	97	35	32	27	52	45	37			
NOV 1 70	SUN	10															0.01	0.38	0.41
NOV 2 70	MON	6																	
NOV 3 70	TUE																		
NOV 4 70	WED																		
NOV 5 70	THU	6	331	173	67	32		146	121	146	95	65	50		94	79			
NOV 5 70	THU	10															0.01	0.38	0.41
NOV 6 70	FRI																		
NOV 7 70	SAT																		
NOV 8 70	SUN	6	224	131	55	19	60	55	33	136	90	61	47	71	62	59			
NOV 8 70	SUN	10															0.02	0.35	0.40
NOV 9 70	MON	6	203	46	38	25	86	58	44	110	61	53	50	68	56	51			
NOV 10 70	TUE	6	154	53	60	41	130	61	50	90	34	34	22	54	39	36			
NOV 10 70	TUE	10															0.02	0.35	0.40
NOV 11 70	WED	6	129	34	49	16	74	54	40	81	36	31	27	44	34	38			
NOV 12 70	THU																		
NOV 13 70	FRI																		
NOV 14 70	SAT																		
NOV 15 70	SUN																		
NOV 16 70	MON																		
NOV 17 70	TUE																		
NOV 18 70	WED																		
NOV 19 70	THU																		
NOV 20 70	FRI																		
NOV 21 70	SAT																		
NOV 22 70	SUN																		
NOV 23 70	MON																		
NOV 24 70	TUE	6	154	38	50	33	91	62	52	127	48	47	43	81	64	68	0.01	0.40	0.33
NOV 25 70	THU																		
NOV 26 70	THU																		
NOV 27 70	FRI																		
NOV 28 70	SAT																		
NOV 29 70	SUN	6	190	43	45	17	72	73	51	131	47	51	40	73	73	56			
NOV 30 70	MON	6	227	68	43	37	88	84	53	129	61	50	46	79	75	67			
DEC 1 70	TUE	6	200	42	32	20	95	72	53	127	48	38	35	70	54	50			
DEC 1 70	TUE	12															0.01	0.49	0.27
DEC 2 70	WED	6	164	104	42	26	76	59	48	133	74	50	48	75	67	69			
DEC 3 70	THU	6	134	25	35	47	76	87	66	116	44	51	46	87	79	72			

Date of Obsv	Day of Week	Samp Type	Inf SS	P-1 SS	F-1 SS	S-1 SS	P-2 SS	F-2 SS	S-2 SS	Inf Org C	P-1 Org C	F-1 Org C	S-1 Org C	P-2 Org C	F-2 Org C	S-2 Org C	Inf NO2	P-1 NO2	F-1 NO2
DEC 3 70	THU	12															0.01	0.49	0.27
DEC 4 70	FRI	99																	
DEC 5 70	SAT	99																	
DEC 6 70	SUN	6	213	35	36	20	92	81	57	109	37	32	26	62	56	46			
DEC 6 70	SUN	12															0.02	0.62	0.45
DEC 7 70	MON	99																	
DEC 8 70	TUE	6	212	78	60	44	115	149	106	132	52	44	39	107	100	86			
DEC 8 70	TUE	12															0.02	0.62	0.45
DEC 9 70	WED	6	173	60	28		101	91	74	137	55	44		37	30	26			
DEC 10 70	THU	6	170	59	22		67	48	74	153	61	39		99	79	73			
DEC 10 70	THU	12															0.02	0.62	0.45
DEC 11 70	FRI	99																	
DEC 12 70	SAT	99																	
DEC 13 70	SUN	6	126	22	12	28	46	28	36	114	40	35	40	81	71	68	0.02	0.59	0.41
DEC 14 70	MON	6	167	26	21	10	63	46	55	143	41	34	30	97	88	75			
DEC 15 70	TUE	6	122	36	13	8	19	29	53	124	26	28	25	83	73	67	0.06	0.68	0.49
DEC 16 70	WED	11	361	54	27	30	108	66		218	55	39	41	109	93				
DEC 17 70	THU	6	113	22	14	9	65	52	54	118	30	26	25	83	69	63	0.05	0.40	0.40
DEC 20 70	SUN	6	124	8	8	3	57	41	47	109	34	25	32	84	71	77	0.02	0.51	0.31
DEC 21 70	MON	6	145	11	20	3	78	37	45	107	26	28	22	25	19	15			
DEC 22 70	TUE	99																	
DEC 23 70	WED	99																	
DEC 24 70	THU	99																	
DEC 25 70	FRI	99																	
DEC 26 70	SAT	99																	
DEC 27 70	SUN	6	131	24	11	7	44	23	33	92	30	23	22	39	36	34	0.04	0.63	0.31
DEC 28 70	MON	6	222	34	18	10	61	79		146	37	23	25	54	58	53			
DEC 29 70	TUE	6	203	50	18	18	88	55	48	133	42	25	25	74	62	53	0.10	0.76	0.40
DEC 30 70	WED	6	163	29	19	20	98	48	38	121	42	32	30	84	68	56			
DEC 31 70	THU	99																	
JAN 1 71	FRI	99																	
JAN 2 71	SAT	99																	
JAN 3 71	SUN	6	168	36	44	11	59	50	39	99	32	20	21	48	47	45	0.02	0.75	0.35
JAN 4 71	MON	6	229	38	29	24	105	115	73	120	30	24	24	60	64	51			
JAN 5 71	TUE	6	131	28	76	14	72	19	49	82	27	46	20	45	21	38	0.03	0.22	0.04
JAN 6 71	WED	6	135	34	15	12	79	73	81	104	28	22	22	57	51	60			
JAN 7 71	THU	6	130	48	16	14	82	116	55	84	39	27	23	72	80	60	0.03	0.59	0.29
JAN 8 71	FRI	99																	
JAN 9 71	SAT	99																	
JAN 10 71	SUN	6	165	24	14	14	65	45	78	100	37	33	35	75	61	78	0.02	0.55	0.27
JAN 11 71	MON	6	120	61	15	17	105	120	82	77	38	21	24	79	59	52			
JAN 12 71	TUE	6	105	22	23	18		30	37	103	57	36	39		47	55	0.01	0.04	0.05
JAN 13 71	WED	6	140	27	12	12		78	49	90	35	21	27		69	57			
JAN 14 71	THU	6	160	37	14	15	67	69	92	140	49	33	31	22	28	23	0.01	0.04	0.06
JAN 15 71	FRI	99																	
JAN 16 71	SAT	99																	
JAN 17 71	SUN	6	188	37	12	21	92	82	64	124	33	24	23	68	56	61	0.01	0.10	0.12
JAN 18 71	MON	6	180	67	38	36	94	153	80	138	37	27	25	74	61	55			
JAN 19 71	TUE	6	158	60	32	39	99	89	72	134	66	47	40	100	69	69	0.01	0.01	0.03
JAN 20 71	WED	6	144	27	31	27	106	74	68	101	60	40	38	75	70	63			
JAN 21 71	THU	6	200	70	34	21	102	101	87	128	78	43	44	87	101	78	0.01	0.02	0.03
JAN 22 71	FRI	99																	
JAN 23 71	SAT	99																	

Date of Obsv	Day of Week	Samp Type	Inf SS	P-1 SS	F-1 SS	S-1 SS	P-2 SS	F-2 SS	S-2 SS	Inf Org C	P-1 Org C	F-1 Org C	S-1 Org C	P-2 Org C	F-2 Org C	S-2 Org C	Inf NO2	F-1 NO2	F-1 NO2
JAN 24 71	SUN	6	180	42	26	11	88	72	39	123	61	39	35	88	83	55	0.02	0.03	0.05
JAN 25 71	MON	6	161	59	23	20	133	95	63	135	60	42	37	80	68	55			
JAN 26 71	TUE	6	160	61	34	24	134	85	70	104	57	34	28	75	64	54	0.01	0.03	0.03
JAN 27 71	WED	6	132	52	19	16	104	72	58	104	74	36	35	67	56	48			
JAN 28 71	THU	6	139	50	20	15	137	83	46	124	60	50	37	73	70	58	0.01	0.04	0.03
JAN 29 71	FRI	99																	
JAN 30 71	SAT	99																	
JAN 31 71	SUN	99																	
FEB 1 71	MON	6	211	55	21	33	180	98	99	174	71	51	52	96	95	79			
FEB 2 71	TUE	6	192	56	33	49	147	104	58	132	67	47	53	112	78	65	0.02	0.03	0.02
FEB 3 71	WED	6	158	80	77	43	122	90	67	123	81	66	66	100	82	62			
FEB 4 71	THU	6	128	55	50	33	80	71	61	105	66	69	46	74	57	55	0.01	0.01	0.01
FEB 5 71	FRI	99																	
FEB 6 71	SAT	99																	
FEB 7 71	SUN	6	130	59	12	22	81	67	35	96	53	33	37	61	48	40	0.10	0.10	0.10
FEB 8 71	MON	6	117	89	46	54	71	74	34	77	62	42	46	63	48	37			
FEB 9 71	TUE	6	123	88	41	47	85	50	78	99	71	44	54	78	59	44	0.10	0.10	0.10
FEB 10 71	WED	6	195	101	66	70	101	116	70	119	81	61	62	84	77	63			
FEB 11 71	THU	6	129	86	88	68	72	105	55	150	89	80	75	82	97	78	0.10	0.10	0.10
FEB 12 71	FRI	99																	
FEB 13 71	SAT	99																	
FEB 14 71	SUN	6	163	155	71	52	127	112	92	107	83	48	49	70	61	55	0.01	0.01	0.03
FEB 15 71	MON	6	176	135	106	90	96	162	94	118	93	81	67	73	76	63			
FEB 16 71	TUE	6	138	87	83	83	177	93	90	122	76	77	70	87	85	61	0.01	0.01	0.01
FEB 17 71	WED	6	98	119	71	73	91	97	108	114	70	62	58	64	64	65			
FEB 18 71	THU	6	169	78	86	69	105	100	88	154	78	69	74	75	70	65	0.01	0.01	0.01
FEB 19 71	FRI	99																	
FEB 20 71	SAT	99																	
FEB 21 71	SUN	6	188	115	103	111	124	143	113	157	111	94	77	96	91	71	0.01	0.01	0.01
FEB 22 71	MON	6	196	86	79	77	95	134	131	129	86	91	78	97	91	82			
FEB 23 71	TUE	6	154	74	186	68	94	99	51	115	80	101	76	84	75	66	0.01	0.01	0.01
FEB 24 71	WED	6	128	79	77	58	85	96	54	91	80	77	68	69	62	52			
FEB 25 71	THU	6	157	93	90	74	100	97	70	123	79	75	70	71	69	58	0.01	0.01	0.01
FEB 26 71	FRI	99																	
FEB 27 71	SAT	99																	
FEB 28 71	SUN	6	165	98	107	74	109	111	58	95	65	66	62	79	67	55	0.02	0.02	0.01
MAR 1 71	MON	6	186	77	83	55	108	80	50	120	68	79	63	73	58	50			
MAR 2 71	TUE	6	170	104	67	62	73	87	74	101	71	68	66	75	63	42	0.02	0.02	0.02
MAR 3 71	WED	6																	
MAR 4 71	THU	6	160	86	68	59	86	72	44	85	56	48	38	58	35	30	0.01	0.01	0.01
MAR 5 71	FRI	99																	
MAR 6 71	SAT	99																	
MAR 7 71	SUN	6	125	98	84	71	100	108	51	78	69	58	59	66	61	40	0.02	0.02	0.03
MAR 8 71	MON	6	186	93	138	92	181	220	149	96	72	72	70	92	109	82			
MAR 9 71	TUE	6	166	94	73	47	106	91	68	103	62	58	52	76	61	56	0.02	0.01	0.01
MAR 10 71	WED	6																	
MAR 11 71	THU	6	179	81	79	55	82	63	64	124	78	72	64	81	68	63			
MAR 12 71	FRI	99																	
MAR 13 71	SAT	99																	
MAR 14 71	SUN	6	103	74	65	41	97	82	47	105	71	69	50	76	75	53			
MAR 15 71	MON	6	240	162	116	87	168	155	106	121	87	74	69	88	84	62			
MAR 16 71	TUE	6	153	92	85	53	120	83	53	135	77	69	56	78	66	49			
MAR 17 71	WED	6	169	86	48	46	86	90	42	127	82	74	67	78	79	61			

Date of Obsv	Day of Week	Samp Type	Inf SS	P-1 SS	F-1 SS	S-1 SS	P-2 SS	F-2 SS	S-2 SS	Inf Org C	P-1 Org C	F-1 Org C	S-1 Org C	P-2 Org C	F-2 Org C	S-2 Org C	Inf NO2	P-1 NO2	F-1 NO2
MAR 18 71	THU	6								95	72	68	71	78	72	52			
MAR 19 71	FRI	99																	
MAR 20 71	SAT	99																	
MAR 21 71	SUN	6	163	73	66	59	91	107	68	132	70	66	65	78	82	63			
MAR 22 71	MON	6	195	94	88	61	122	154	90	160	61	60	36	80	76	54			
MAR 23 71	TUE	6	152	139	122	76	94	82	90	141	110	105	92	114	112	93	0.01	0.01	0.01
MAR 24 71	WED	6																	
MAR 25 71	THU	6	170	78	122	60	142	152	61										
MAR 26 71	FRI	99																	
MAR 27 71	SAT	99																	
MAR 28 71	SUN	6	143	89	132	72	111	174	74	90	64	73	60	73	76	54			
MAR 29 71	MON	6	141	131	177	114	144	168	89	96	67	72	54	73	69	53			
MAR 30 71	TUE	6	156	65	107	69	92	96	94	96	64	84	57	77	87	74			
MAR 31 71	WED	6	144	70	122	79	90	91	45	96	60	62	56	68	59	43			
APR 1 71	THU	6								95	64	67	73	61	63	78			
APR 2 71	FRI	99																	
APR 3 71	SAT	99																	
APR 4 71	SUN	6	178	66	111	56	99	122	39	97	53	58	46	65	62	37			
APR 5 71	MON	6	170	164	115	64	133	130	60	101	59	53	51	63	61	48			
APR 6 71	TUE	6	171	115	92	63	109	78	56	111	79	56	49	81	62	47	0.01	0.01	0.05
APR 7 71	WED	6	190	72	91	52	121	110	77	94	39	46	35	61	52	43			
APR 8 71	THU	6	161	71	80	89	95	154	57	116	69	70	55	79	116	64			
APR 9 71	FRI	99																	
APR 10 71	SAT	99																	
APR 11 71	SUN	99																	
APR 12 71	MON	6	216	112	105	67	128	175	95	118	73	68	59	96	108	71			
APR 13 71	TUE	6	222	113	71	72	102	128	103	156	80	66	64	89	93	72			
APR 14 71	WED	6								131	66	68	55	92	79	67			
APR 15 71	THU	6	163	81	42	63	87	107	58	133	77	67	67	92	94	79			
APR 16 71	FRI	99																	
APR 17 71	SAT	99																	
APR 18 71	SUN	6	158	55	62	33	86	125	56	149	76	79	59	89	98	75			
APR 19 71	MON	6	196	54	53	29	85	89	39	147	67	56	46	79	83	65			
APR 20 71	TUE	6	216	59	84	59	98	74	78	125	59	59	50	79	55	58			
APR 21 71	WED	6	193	50	38	19	58	54	48	124	51	42	43	63	59	51			
APR 22 71	THU	6								121	56	47	43	80	81	62	0.02	0.01	0.01
APR 23 71	FRI	99																	
APR 24 71	SAT	99																	
APR 25 71	SUN	6	233	36	50	24	78	107	29	140	51	51	41	74	79	56			
APR 26 71	MON	6	158	95	111	52	121	126	67	97	56	60	48	71	76	58			
APR 27 71	TUE	6	213	63	59	43	86	83	53	174	77	61	56	90	85	65			
APR 28 71	WED	6																	
APR 29 71	THU	6	181	65	79	77	85	98	72	116	64	57	50	73	71	63			
APR 30 71	FRI	99																	
MAY 1 71	SAT	99																	
MAY 2 71	SUN	6	205	86	350	90	90	159	64	110	64	147	75	77	76	42			
MAY 3 71	MON	6	165	60	55	83	72	83	65	128	68	50	52	69	58	53			
MAY 4 71	TUE	6	158	94	65	64	94	83	55	139	63	55	61	69	64	51	0.01	0.01	0.01
MAY 5 71	WED	99																	
MAY 6 71	THU	6	222	56	73	94	96	104	103	128	53	44	62	56	63	46			
MAY 7 71	FRI	99																	
MAY 8 71	SAT	99																	
MAY 9 71	SUN	6	276	92	64	72		72	126	172	73	49	49		52	70			

Date of Obsv	Day of Week	Samp Type	Inf SS	P-1 SS	F-1 SS	S-1 SS	P-2 SS	F-2 SS	S-2 SS	Inf Org C	P-1 Org C	F-1 Org C	S-1 Org C	P-2 Org C	F-2 Org C	S-2 Org C	Inf NO2	P-1 NO2	F-1 NO2
MAY 10 71	MON	99																	
MAY 11 71	TUE	99																	
MAY 12 71	WED	99																	
MAY 13 71	THU	99																	
MAY 14 71	FRI	99																	
MAY 15 71	SAT	99																	
MAY 16 71	SUN	6	146	61	43	51	97	66	69	135	63	60	55	87	64	56			
MAY 17 71	MON	6	216	35	26	22	54	64	33	145	65	50	54	74	64	48			
MAY 18 71	TUE	6	170	34	21	23	44	64	21	211	91	74	74	97	89	69			
MAY 19 71	WED	99																	
MAY 20 71	THU	6	175	37	34	14	38	72	33	137	77	76	61	79	81	61			
MAY 21 71	FRI	99																	
MAY 22 71	SAT	99																	
MAY 23 71	SUN	6	167	36	37	19	35	64	23	168	74	65	59	74	69	58			
MAY 24 71	MON	6								179	99	70	72	112	78	73			
MAY 25 71	TUE	6	149	27	16	9	37	21	10	162	88	67	62	102	78	68			
MAY 26 71	WED	6	145	7	33	15	34	22	15	171	84	73	56	87	71	63			
MAY 27 71	THU	6	132	26	16	19	30	21	34	153	68	56	49	77	68	65			
MAY 28 71	FRI	99																	
MAY 29 71	SAT	99																	
MAY 30 71	SUN	99																	
MAY 31 71	MON	6	87	26	9	12	42	20	16	86	51	31	31	66	41	37			
JUN 1 71	TUE	6	181	50	37	12	61	27	13	173	96	66	41	94	68	52			
JUN 2 71	WED	6	231	50	23	26	57	44	21	192	85	62	60	94	77	65			
JUN 3 71	THU	6	166	30	14	15	14	22	52	177	71	50	48	73	63	54			
JUN 4 71	FRI	99																	
JUN 5 71	SAT	99																	
JUN 6 71	SUN	6	221	52	98	41	79	71	41	130	45	65	37	65	65	36			
JUN 7 71	MON	6								131	63	69	44	65	74	45			
JUN 8 71	TUE	6								104	59	47	42	51	46	47			
JUN 9 71	WED	6								126	59	51	44	60	48	41			
JUN 10 71	THU	6	194	57	79	32	60	39	25	142	78	62	45	71	58	55			
JUN 11 71	FRI	99																	
JUN 12 71	SAT	99																	
JUN 13 71	SUN	6	198	42	37	19	38	42	25										
JUN 14 71	MON	6	183	51	34	13	61	27	13										
JUN 15 71	TUE	6	196	57	29	28	92	43	34										
JUN 16 71	WED	6	173	35	42	14	35	25	13										
JUN 17 71	THU	99																	
JUN 18 71	FRI	99																	
JUN 19 71	SAT	99																	
JUN 20 71	SUN	99																	
JUN 21 71	MON	99																	
JUN 22 71	TUE	6	247	68	79	61	63	40	48	120	67	68	66	59	43	37			
JUN 23 71	WED	99																	
JUN 24 71	THU	6								109	50	40	44	60	39	35			
JUN 25 71	FRI	99																	
JUN 26 71	SAT	6	164	30	20	20	36	23	15	112	49	33	36	48	37	32			
JUN 27 71	SUN	99																	
JUN 28 71	MON	6	208	41	64	23	52	41	19	116	57	55	40	48	52	30			
JUN 29 71	TUE	6								106	56	56	51	52	36	34			
JUN 30 71	WED	6	170	55	44	28	57	47	21	113	60	52	41	49	47	35			
JUL 1 71	THU	6								114	71	61	52	64	43	46			

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Date of Obsv			Day of Week	Samp Type	Inf SS	P-1 SS	F-1 SS	S-1 SS	P-2 SS	F-2 SS	S-2 SS	Inf Org C	P-1 Org C	F-1 Org C	S-1 Org C	P-2 Org C	F-2 Org C	S-2 Org C	Inf NO2	P-1 NO2	F-1 NO2
JUL	2	71	FRI	99																	
JUL	3	71	SAT	99																	
JUL	4	71	SUN	99																	
JUL	5	71	MON	6	219	47	45	30	69	74	20	119	50	40	34	49	43	29			
JUL	6	71	TUE	6	172	86	36	24	36	27	41	103	67	40	29	42	32	36			
JUL	7	71	WED	6								133	51	43	35	64		47			
JUL	8	71	THU	6	142	36	35	37	59	51	35	122	69	47	43	45	44	41	0.01	0.02	0.11
JUL	9	71	FRI	99																	
JUL	10	71	SAT	6	126	41	17	16	40	22	10	113	75	38	36	48	37	34			
JUL	11	71	SUN	99																	
JUL	12	71	MON	6	114	35	28	9	47	51	11	66	46	44	34	52	54	33			
JUL	13	71	TUE	6	146	47	39	25	53	37	39	117	76	39	32	55	33	36			
JUL	14	71	WED	6	194	58	59	13	70	24	10	118	79	53	32	56	33	29			
JUL	15	71	THU	6	143	43	41	15	29	33	8	126	86	58	35	45	39	28	0.01	0.01	0.14
JUL	16	71	FRI	99																	
JUL	17	71	SAT	6	139	46	43	14	50	29	13	122	100	50	37	57	34	28			
JUL	18	71	SUN	99																	
JUL	19	71	MON	6	151	52	26	9	35	65	9	143	79	40	29	43	54	26			
JUL	20	71	TUE	6	184	45	24	17	28	16	12	125	74	43	31	46	35	30			
JUL	21	71	WED	6	171	48	15	9	43		9	114	60	24	22	38	53	26			
JUL	22	71	THU	6	163	47	17	12	33	10	13	109	68	23	28	38	29	27	0.01	0.03	0.15
JUL	23	71	FRI	99																	
JUL	24	71	SAT	6	100	37	9	6	26	19	11	150	85	35	35	52	40	37			
JUL	25	71	SUN	99																	
JUL	26	71	MON	6	178	47	71	15	53	30	16	143	85	59	38	51	42	35			
JUL	27	71	TUE	6	123	55	94	28	37	30	20	140	79	78	47	45	32	31			
JUL	28	71	WED	6	398	35	120	22	34	46	21	133	80	74	45	50	44	33			
JUL	29	71	THU	6								116	74	43	48	38	28	24			
JUL	30	71	FRI	99																	
JUL	31	71	SAT	99																	
AUG	1	71	SUN	99																	
AUG	2	71	MON	6	200	62	47	48	40	36	15	99	69	43	61	32	31	24			
AUG	3	71	TUE	6	162	43	27	18	38	74	14	114	65	37	36	38	67	27			
AUG	4	71	WED	6	159	46	1	9	44	42	16	89	61	28	23	30	17	15			
AUG	5	71	THU	6	122	30	26	14	37	26	27	105	67	42	38	43	43	32	0.04	0.03	0.23
AUG	6	71	FRI	99																	
AUG	7	71	SAT	99																	
AUG	8	71	SUN	99																	
AUG	9	71	MON	6	184	75	33	25	51	23	12	170	92	45	43	57	47	31			
AUG	10	71	TUE	6	170	42	29	13	37	41	11	169	90	45	41	55	54	40			
AUG	11	71	WED	6	136	73	35	11	39	15	11	130	94	51	46	59	47	37			
AUG	12	71	THU	6	120	46	26	25	40	31	16	141	59	34	36	49	43	29	0.03	0.07	0.15
AUG	13	71	FRI	99																	
AUG	14	71	SAT	6	109	64	62	28	62	63	32	100	59	56	33	40	43	30			
AUG	15	71	SUN	99																	
AUG	16	71	MON	6	173	39	26	15	59	45	18	131	67	27	27	38	35	30			
AUG	17	71	TUE	6	143	46	21	15	23		13	85	55	27	25	39		27	0.02	0.03	0.20
AUG	18	71	WED	6								92	85	35	39	44	38	28			
AUG	19	71	THU	6	146	29	15	22	37	38	14	106	62	32	26	41	38	31	0.02	0.08	0.07
AUG	20	71	FRI	99																	
AUG	21	71	SAT	6	107	30	9	8	69	46		152	57	33	35	53	45				
AUG	22	71	SUN	99																	
AUG	23	71	MON	6	108	44	33	11	31	34	22	149	77	45	29	41	39	39			

Date of Obsv	Day of Week	Samp Type	Inf SS	P-1 SS	F-1 SS	S-1 SS	P-2 SS	F-2 SS	S-2 SS	Inf Org C	P-1 Org C	F-1 Org C	S-1 Org C	P-2 Org C	F-2 Org C	S-2 Org C	Inf NO2	P-1 NO2	F-1 NO2
AUG 24 71	TUE	6	200	43	32	12	23	33	12	139	91	53	40	51	50	42	0.02	0.02	0.23
AUG 25 71	WED	6								122	62	23	27	37	37	29			
AUG 26 71	THU	6	138	37	14	12	30	57	17	145	81	31	33	52	56	35	0.02	0.02	0.18
AUG 27 71	FRI	99																	
AUG 28 71	SAT	6	177	83	23	37	24	140	13	179	25	40	33	60	297	39			
AUG 29 71	SUN	99																	
AUG 30 71	MON	6	140	69	48	23	92	30	18	167	113	53	38	68	41	41			
AUG 31 71	TUE	6	78	27	44	38	26	27	15	156	89	33	37	57	46	35	0.10	0.03	0.21
SEP 1 71	WED	6	115	43	40	19	48	37	22	196	70	32	28	50	40	37			
SEP 2 71	THU	6	107	50	32	22	34	35	39	141	92	46	48	71	54	55	0.03	0.09	0.21
SEP 3 71	FRI	99																	
SEP 4 71	SAT	99																	
SEP 5 71	SUN	99																	
SEP 6 71	MON	99																	
SEP 7 71	TUE	6								131	50	40	37	74	25	55	0.08	0.18	0.42
SEP 8 71	WED	6	141	37	25	18	40	30	40	153	66	36	39	93	107	54			
SEP 9 71	THU	6								216	71	55	48	109		46	0.01	0.05	0.17
SEP 10 71	FRI	99																	
SEP 11 71	SAT	6	146	55	73	26	45	90	42	149	60	63	44	75	88	71			
SEP 12 71	SUN	99																	
SEP 13 71	MON	6	156	75	90	81	61	65	28	139	69	73	68	113	67	36			
SEP 14 71	TUE	99																	
SEP 15 71	WED	6	117	47	77	46	45	53	32	153	64	62	55	101	64	49			
SEP 16 71	THU	6	145	40	41	26	33	14	24	130	76	58	48	50	46	51	0.01	0.03	0.13
SEP 17 71	FRI	99																	
SEP 18 71	SAT	6	171	28	23	18	39	81	28	125	55	38	35	84	72	41			
SEP 19 71	SUN	99																	
SEP 20 71	MON	6	182	57	72	29	67	52	33	199	70	60	46	111	52	47			
SEP 21 71	TUE	6	115	57	34	24	49	41	26	116	63	44	37	83	63	42	0.02	0.03	0.23
SEP 22 71	WED	6	145	57	29	22	58	44	35	98	42	30	27	47	35	33			
SEP 23 71	THU	6	158	31	60	18	72		31	107	37	46	31	59		39	0.02	0.16	0.06
SEP 24 71	FRI	99																	
SEP 25 71	SAT	6	116	22	16	13	61		26	115	42	28	29	82		34			
SEP 26 71	SUN	99																	
SEP 27 71	MON	6	132							119									
SEP 28 71	TUE	99																	
SEP 29 71	WED	99																	
SEP 30 71	THU	6	95	56	52	32	81	59	17	121	49	37	40	55	46	30			
OCT 1 71	FRI	99																	
OCT 2 71	SAT	6	93	37		20	33	21	27	85	34		23	50	29	26			
OCT 3 71	SUN	99																	
OCT 4 71	MON	6	125	53	31	42	42	26	25	127	55	33	32	51	34	23			
OCT 5 71	TUE	6	151	44		28	54		27	133	43	37	32	79	65	31			
OCT 6 71	WED	6	116	20	26	32	87	37	14	83	40	33	36	62	34	27			
OCT 7 71	THU	99																	
OCT 8 71	FRI	99																	
OCT 9 71	SAT	99																	
OCT 10 71	SUN	6								72	40	29	44	45	96	31			
OCT 11 71	MON	6	122	43	44	35	57	36	37	139	46	37	36	41	29	24			
OCT 12 71	TUE	6	96	30		81	49		20	101	39	36	60	47	37	30			
OCT 13 71	WED	6	177	44	88	26	63	53	36	128	42	47	35	66	40	38			
OCT 14 71	THU	6	72	41		37	63		22	118	79	42	60	87	69	38			
OCT 15 71	FRI	99																	

Date of Obsv			Day of Week	Samp Type	Inf SS	P-1 SS	F-1 SS	S-1 SS	P-2 SS	F-2 SS	S-2 SS	Inf Org C	P-1 Org C	F-1 Org C	S-1 Org C	P-2 Org C	F-2 Org C	S-2 Org C	Inf NO2	P-1 NO2	F-1 NO2
OCT	16	71	SAT	6	161	38	25	22	93	40	30	112	41	32	34	48	41	32			
OCT	17	71	SUN	99																	
OCT	18	71	MON	6	116	48	30	38	80	51	26	143	62	46	55	89	52	46			
OCT	19	71	TUE	6	120	45		38	76		31	134	71	44	46	61	51	40			
OCT	20	71	WED	6	96	53	35	38	61	206	24	136	66	41	48	66	140	38			
OCT	21	71	THU	6	134	33		32	49		21	152	55	42	47	67	67	38			
OCT	22	71	FRI	99																	
OCT	23	71	SAT	6	98	25	23	20	57	21	26	55	31	22	43	35	24	27			
OCT	24	71	SUN	99																	
OCT	25	71	MON	99																	
OCT	26	71	TUE	99																	
OCT	27	71	WED	99																	
OCT	28	71	THU	99																	
OCT	29	71	FRI	99																	
OCT	30	71	SAT	99																	
OCT	31	71	SUN	99																	
NOV	1	71	MON	6	176	56	61	29	77	73	44	146	81	63	57	92	51	56			
NOV	2	71	TUE	6	177	50		39	75		39	142	89	91	55	70	68	62			
NOV	3	71	WED	6								183	79	75	65	90	72	65			
NOV	4	71	THU	99																	
NOV	5	71	FRI	99																	
NOV	6	71	SAT	99																	
NOV	7	71	SUN	99																	
NOV	8	71	MON	99																	
NOV	9	71	TUE	99																	
NOV	10	71	WED	6	154	47	72	44	86	105	36	201	86	84	71	89	99	76			
NOV	11	71	THU	6	171	65		52	79		68	144	81	65	66	88	48	56			
NOV	12	71	FRI	99																	
NOV	13	71	SAT	6	172	31	57	34	78	53	29	159	64	45	44	61	52	50			
NOV	14	71	SUN	99																	
NOV	15	71	MON	6	212	83	76	34	107	103	66	186	103	76	72	108	89	78			
NOV	16	71	TUE	6	246	52	54	37	107	66	44	186	80	73	67	90	76	59			
NOV	17	71	WED	6	155	55	35	32	117	56	35	217	91	70	63	122	75	55			
NOV	18	71	THU	6	204	33	55	35	79	50	20	145	82	75	53	87	64	55			
NOV	19	71	FRI	99																	
NOV	20	71	SAT	6	188	41	30	28	79	55	52	129	42	28	30	49	43	38			
NOV	21	71	SUN	99																	
NOV	22	71	MON	6	98	26	16	18	68	34	16	140	62	50	50	79	48	43			
NOV	23	71	TUE	6	123	39	26		81	68	35	121	62	43		70	73	40			
NOV	24	71	WED	99																	
NOV	25	71	THU	99																	
NOV	26	71	FRI	99																	
NOV	27	71	SAT	6	90	29	49	322	57	93	22	65	36	35	146	35	46	26			
NOV	28	71	SUN	99																	
NOV	29	71	MON	6	177	48	46	28	33	52	40	150	67	43	39	76	61	47			
NOV	30	71	TUE	15	165	39	40	27	91	45	45	144	66	34	31	85	39	39			
DEC	1	71	WED	15								140	60	39	41	76	53	41			
DEC	2	71	THU	15	115	46	23	28	84	32	35	137	63	35	40	79	44	40			
DEC	3	71	FRI	99																	
DEC	4	71	SAT	15	215	39	34	21	80		33	143	64	41	38	78		47			
DEC	5	71	SUN	99																	
DEC	6	71	MON	15	170	54	30	23	79	57	48	178	79	42	40	79	61	51			
DEC	7	71	TUE	15	184	53	67	25	97	79	41	134	68	53	36	80	67	39			

Date of Obsv	Day of Week	Samp Type	Inf SS	P-1 SS	F-1 SS	S-1 SS	P-2 SS	F-2 SS	S-2 SS	Inf Org C	P-1 Org C	F-1 Org C	S-1 Org C	P-2 Org C	F-2 Org C	S-2 Org C	Inf NO2	P-1 NO2	F-1 NO2
DEC 8 71	WED	15	231	36	54	50	109	80	47	174	70	47	40	74	58	42			
DEC 9 71	THU	15	195	95	147	34	98	104	49	154	76	82	42	89	81	52			
DEC 10 71	FRI	99																	
DEC 11 71	SAT	15	213	78	60	42	152	104		146	84	68	55	122	79				
DEC 12 71	SUN	99																	
DEC 13 71	MON	15	233	88	95	68	124	112	54	198	80	78	63	109	79	49			
DEC 14 71	TUE	15	219	64	144	52	129	87	60	142	71	83	48	88	74	61			
DEC 15 71	WED	15	272	197	88	77	158	101	78	158	110	72	51	97	76	53			
DEC 17 71	FRI	99																	
DEC 18 71	SAT	15	150	51	53	35	106	51	26	151	68	52	47	82	58	51			
DEC 19 71	SUN	99																	
DEC 20 71	MON	15	137	47	42	29	93	73	45	111	53	47	42	90	55	46			
DEC 21 71	TUE	99																	
DEC 22 71	WED	99																	
DEC 23 71	THU	99																	
DEC 24 71	FRI	99																	
DEC 25 71	SAT	99																	
DEC 26 71	SUN	99																	
DEC 27 71	MON	99																	
DEC 28 71	TUE	15	157	54	43	27	71	70	50	131	54	40	38	57	57	46			
DEC 29 71	WED	15	157	37	33	54	57	38	33	93	51	46	51	62	52	48			
DEC 30 71	THU	15	154	49	28	23	82	55	49	186	75	45	41	78	52	49			
DEC 31 71	FRI	99																	
JAN 1 72	SAT	99																	
JAN 2 72	SUN	99																	
JAN 3 72	MON	15	217	68	29	22	57	80	61	187	79	57	45	73	81	66			
JAN 4 72	TUE	15	199	44	45	22	52	27	23	140	68	54	49	76	44	43			
JAN 5 72	WED	15	175	45	31	22	62	25	25	86	56	47	45	53	44	43			
JAN 6 72	THU	15	225	59	29	126	85	10	41	152	66	53	74	85	50	53			
JAN 7 72	FRI	99																	
JAN 8 72	SAT	15	76	42	46		44			82	46	68		68					
JAN 9 72	SUN	99																	
JAN 10 72	MON	15	87	62	72	55	95	73	45	142	61	56	48	75	56	45			
JAN 11 72	TUE	15	74	31		31	32	29	15	77	49		33	49	48	36	0.01	0.05	
JAN 12 72	WED	15	215	102	377	235	369	134	114	139	86	55	46	73	52	51			
JAN 13 72	THU	99																	
JAN 14 72	FRI	99																	
JAN 15 72	SAT	15	113	65	90	71	97	30	115	98	63	67	46	62	35	53			
JAN 16 72	SUN	99																	
JAN 17 72	MON	15	185	82	556	78	303	13	58	136	92	78	65	83	80	63			
JAN 18 72	TUE	15	178	55		24	58		66	155	72	54	40	72	76	54	0.02	0.03	0.12
JAN 19 72	WED	15	512	66	93	42	57	77	51	161	76	76	55	76	83	68			
JAN 20 72	THU	15	142	44	62	85	75	92	51	207	75	83	58	97	89	72	0.01	0.01	0.10
JAN 21 72	FRI	99																	
JAN 22 72	SAT	15	120	46	48	18	55	91	34	119	63	52	36	63	69	53			
JAN 23 72	SUN	99																	
JAN 24 72	MON	15	236	102	110	101	83	108	58	160	97	80	86	84	82	42			

Date of Obsv	Day of Week	Samp Type	S-1 NO2	P-2 NO2	F-2 NO2	S-2 NO2	Inf NO3	P-1 NO3	F-1 NO3	S-1 NO3	P-2 NO3	F-2 NO3	S-2 NO3	Inf NH3	P-1 NH3	F-1 NH3	S-1 NH3
NOV 19 69	WED	6															
NOV 19 69	WED	4															
NOV 20 69	THU	6															
NOV 20 69	THU	4															
NOV 21 69	FRI	6															
NOV 21 69	FRI	7	0.05	0.05	0.05	0.05	0.05	0.05	0.15	0.05	0.05	0.10	0.05	28.3	27.3	27.0	28.1
NOV 22 69	SAT	4															
NOV 22 69	SAT	7	0.05	0.05	0.05	0.05	0.05	0.05	0.15	0.05	0.05	0.10	0.05	28.3	27.3	27.0	28.1
NOV 23 69	SUN	4															
NOV 23 69	SUN	7	0.05	0.05	0.05	0.05	0.05	0.05	0.15	0.05	0.05	0.10	0.05	28.3	27.3	27.0	28.1
NOV 24 69	MON	6															
NOV 24 69	MON	4	0.07	0.05	0.05	0.05	0.05	0.05	0.15	0.03	0.05	0.10	0.05	28.2	26.2	25.6	25.2
NOV 25 69	TUE	6															
NOV 25 69	TUE	4	0.07	0.05	0.05	0.05	0.05	0.05	0.15	0.03	0.05	0.10	0.05	28.2	26.2	25.6	25.2
NOV 26 69	WED																
NOV 27 69	THU																
NOV 28 69	FRI																
NOV 29 69	SAT	4	0.14	0.20	0.20	0.15	0.05	0.17	0.99	0.21	0.10	0.80	0.25	26.6	23.0	22.9	23.2
NOV 30 69	SUN	4	0.14	0.20	0.20	0.15	0.05	0.17	0.99	0.21	0.10	0.80	0.25	26.6	23.0	22.9	23.2
DEC 1 69	MON	6															
DEC 1 69	MON	4	0.11	0.05	0.08	0.10	0.05	0.04	0.33	0.19	0.05	0.17	0.05	33.6	30.0	30.0	29.8
DEC 2 69	TUE	6															
DEC 2 69	TUE	4	0.11	0.05	0.08	0.10	0.05	0.04	0.33	0.19	0.05	0.17	0.05	33.6	30.0	30.0	29.8
DEC 3 69	WED	6															
DEC 3 69	WED	4	0.14	0.05	0.07	0.10	0.05	0.05	0.30	0.16	0.05	0.08	0.05	32.2	31.6	30.2	30.9
DEC 4 69	THU	6															
DEC 4 69	THU	4	0.14	0.05	0.07	0.10	0.05	0.05	0.30	0.16	0.05	0.08	0.05	32.2	31.6	30.2	30.9
DEC 5 69	FRI	6															
DEC 5 69	FRI	7	0.06	0.05	0.05	0.09	0.05	0.05	0.21	0.04	0.05	0.05	0.01	26.2	26.2	26.2	25.9
DEC 6 69	SAT	4															
DEC 6 69	SAT	7	0.06	0.05	0.05	0.09	0.05	0.05	0.21	0.04	0.05	0.05	0.01	26.2	26.2	26.2	25.9
DEC 7 69	SUN	4															
DEC 7 69	SUN	7	0.06	0.05	0.05	0.09	0.05	0.05	0.21	0.04	0.05	0.05	0.01	26.2	26.2	26.2	25.9
DEC 8 69	MON	6															
DEC 8 69	MON	4	0.15	0.05	0.08	0.11	0.05	0.05	0.40	0.60	0.05	0.27	0.29	25.2	24.8	20.7	24.8
DEC 9 69	TUE	6															
DEC 9 69	TUE	4	0.15	0.05	0.08	0.11	0.05	0.05	0.40	0.60	0.05	0.27	0.29	25.2	24.8	20.7	24.8
DEC 10 69	WED	6															
DEC 10 69	WED	4	0.18	0.05	0.06	0.06	0.05	0.05	0.21	0.57	0.05	0.19	0.19	20.2	23.0	22.6	22.2
DEC 11 69	THU	6															
DEC 11 69	THU	4	0.18	0.05	0.06	0.06	0.05	0.05	0.21	0.57	0.05	0.19	0.19	20.2	23.0	22.6	22.3
DEC 12 69	FRI	7	0.08	0.05	0.05	0.05	0.05	0.05	0.05	0.22	0.05	0.10	0.05	27.0	25.2	25.6	27.0
DEC 12 69	FRI	6															
DEC 13 69	SAT	7	0.08	0.05	0.05	0.05	0.05	0.05	0.05	0.22	0.05	0.10	0.05	27.0	25.2	25.6	27.0
DEC 13 69	SAT	4															
DEC 14 69	SUN	7	0.08	0.05	0.05	0.05	0.05	0.05	0.05	0.22	0.05	0.10	0.05	27.0	25.2	25.6	27.0
DEC 14 69	SUN	4															
DEC 15 69	MON	4															
DEC 15 69	MON	6															
DEC 16 69	TUE	6															
DEC 16 69	TUE	4															
DEC 17 69	WED	6															
DEC 17 69	WED	4															

Date of Obsv	Day of Week	Samp Type	S-1 NO2	P-2 NO2	F-2 NO2	S-2 NO2	Inf NO3	P-1 NO3	F-1 NO3	S-1 NO3	P-2 NO3	F-2 NO3	S-2 NO3	Inf NH3	P-1 NH3	F-1 NH3	S-1 NH3
DEC 18 69	THU	6															
DEC 18 69	THU	4															
DEC 19 69	FRI																
DEC 20 69	SAT																
DEC 21 69	SUN																
DEC 22 69	MON																
DEC 23 69	TUE																
DEC 24 69	WED																
DEC 25 69	THU																
DEC 26 69	FRI																
DEC 27 69	SAT																
DEC 28 69	SUN																
DEC 29 69	MON	6															
DEC 29 69	MON	4															
DEC 30 69	TUE	6															
DEC 30 69	TUE	4															
JAN 1 70	THU																
JAN 2 70	FRI																
JAN 5 70	MON																
JAN 6 70	TUE																
JAN 7 70	WED																
JAN 8 70	THU																
JAN 9 70	FRI																
JAN 10 70	SAT																
JAN 11 70	SUN																
JAN 12 70	MON																
JAN 13 70	TUE																
JAN 14 70	WED																
JAN 15 70	THU																
JAN 16 70	FRI																
JAN 17 70	SAT	4															
JAN 18 70	SUN	4															
JAN 19 70	MON	4	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	22.6	22.6	23.6	22.8
JAN 20 70	TUE	4	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	22.6	22.6	23.6	22.8
JAN 21 70	WED	4	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	18.4	22.0	26.1	24.8
JAN 22 70	THU	4	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	18.4	22.0	26.1	24.8
JAN 23 70	FRI	7	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	14.8	21.4	21.4	21.4
JAN 24 70	SAT	7	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	14.8	21.4	21.4	21.4
JAN 25 70	SUN	7	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	14.8	21.4	21.4	21.4
JAN 26 70	MON	4	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	24.2	30.0	25.2	24.4
JAN 27 70	TUE	4	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	24.2	30.0	25.2	24.4
JAN 28 70	WED	4	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	20.8	24.4	26.4	26.2
JAN 29 70	THU	4	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	20.8	24.4	26.4	26.2
JAN 30 70	FRI	7	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	18.4	19.4	20.0	20.8
JAN 31 70	SAT	7	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	18.4	19.4	20.0	20.8
FEB 1 70	SUN	7	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	18.4	19.4	20.0	20.8
FEB 2 70	MON	4	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	15.4	16.0	17.4	17.4
FEB 3 70	TUE	4	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	15.4	16.0	17.4	17.4
FEB 4 70	WED	4	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	23.0	23.0	24.8	24.8
FEB 5 70	THU	4	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	23.0	23.0	24.8	24.8
FEB 6 70	FRI																
FEB 7 70	SAT	4	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	22.0	23.4	24.2	23.2
FEB 8 70	SUN	4	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	22.0	23.4	24.2	23.2

Date of Obsv	Day of Week	Samp Type	S-1 NO2	P-2 NO2	F-2 NO2	S-2 NO2	Inf NO3	P-1 NO3	F-1 NO3	S-1 NO3	P-2 NO3	F-2 NO3	S-2 NO3	Inf NH3	P-1 NH3	F-1 NH3	S-1 NH3
FEB 9 70	MON	4	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	24.2	24.4	25.8	25.0
FEB 10 70	TUE	4	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	24.2	24.4	25.8	25.0
FEB 11 70	WED	4	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	24.4	25.2	26.4	25.0
FEB 12 70	THU	4	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	24.4	25.2	26.4	25.0
FEB 13 70	FRI	7	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	21.8	23.4	25.4	23.8
FEB 14 70	SAT	7	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	21.8	23.4	25.4	23.8
FEB 15 70	SUN	7	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	21.8	23.4	25.4	23.8
FEB 16 70	MON	4	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	15.6	17.8	19.4	18.6
FEB 17 70	TUE	4	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	15.6	17.8	19.4	18.6
FEB 18 70	WED	4	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	16.2	17.4	19.2	18.4
FEB 19 70	THU	4	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	16.2	17.4	19.2	18.4
FEB 20 70	FRI	7	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	18.4	20.6	22.0	21.4
FEB 21 70	SAT	7	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	18.4	20.6	22.0	21.4
FEB 22 70	SUN	7	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	18.4	20.6	22.0	21.4
FEB 23 70	MON	4	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	21.6	18.4	24.0	24.2
FEB 24 70	TUE	4	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	21.6	18.4	24.0	24.2
FEB 25 70	WED	4	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.40	0.30	18.2	19.4	21.4	21.0
FEB 26 70	THU	4	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.40	0.30	18.2	19.4	21.4	21.0
FEB 27 70	FRI																
FEB 28 70	SAT																
MAR 1 70	SUN																
MAR 2 70	MON	4	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	18.8	22.2	24.4	24.0
MAR 3 70	TUE	4	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	18.8	22.2	24.4	24.0
MAR 4 70	WED	4	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	20.2	19.4	21.2	20.6
MAR 5 70	THU	4	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	20.2	19.4	21.2	20.6
MAR 6 70	FRI	7	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	25.0	23.4	28.2	26.0
MAR 7 70	SAT	7	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	25.0	23.4	28.2	26.0
MAR 8 70	SUN	7	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	25.0	23.4	28.2	26.0
MAR 9 70	MON	4	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	21.8	24.2	24.4	25.0
MAR 10 70	TUE	4	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	21.8	24.2	24.4	25.0
MAR 11 70	WED	4	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	22.0	29.0	30.0	30.0
MAR 12 70	THU	4	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	22.0	29.0	30.0	30.0
MAR 13 70	FRI	4	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	24.0	22.0	22.6	22.6
MAR 14 70	SAT	4	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	24.0	22.0	22.6	22.6
MAR 15 70	SUN																
MAR 16 70	MON	4	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	27.0	27.0	27.0	26.6
MAR 17 70	TUE	4	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	27.0	27.0	27.0	26.6
MAR 18 70	WED	4	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	27.0	29.0	30.6	30.0
MAR 19 70	THU	4	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	27.0	29.0	30.6	30.0
MAR 20 70	FRI																
MAR 21 70	SAT																
MAR 22 70	SUN																
MAR 23 70	MON	4	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	19.0	21.0	20.6	20.0
MAR 24 70	TUE	4	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	19.0	21.0	20.6	20.0
MAR 25 70	WED	4	0.02	0.05	0.05	0.05	0.05			0.03	0.05			16.4	18.0	19.6	22.6
MAR 26 70	THU	4	0.02	0.05	0.05	0.05	0.05			0.03	0.05			16.4	18.0	19.6	22.6
MAR 27 70	FRI																
MAR 28 70	SAT																
MAR 29 70	SUN																
MAR 30 70	MON	4	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	18.6	20.6	19.4	19.4
MAR 31 70	TUE	4	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	18.6	20.6	19.4	19.4
APR 1 70	WED																
APR 2 70	THU																

Date of Obsv	Day of Week	Samp Type	S-1 NO2	P-2 NO2	F-2 NO2	S-2 NO2	Inf NO3	P-1 NO3	F-1 NO3	S-1 NO3	P-2 NO3	F-2 NO3	S-2 NO3	Inf NH3	P-1 NH3	F-1 NH3	S-1 NH3
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APR 3 70	FRI	7	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	22.0	20.0	20.0	19.0
APR 4 70	SAT	7	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	22.0	20.0	20.0	19.0
APR 5 70	SUN	7	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	22.0	20.0	20.0	19.0
APR 6 70	MON	4	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	24.0	25.0	27.0	27.4
APR 7 70	TUE	4	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	24.0	25.0	27.0	27.4
APR 8 70	WED	4															
APR 9 70	THU	4															
APR 10 70	FRI	7															
APR 11 70	SAT	7															
APR 12 70	SUN	7															
APR 13 70	MON																
APR 14 70	TUE																
APR 15 70	WED	4		0.30	0.30	0.30	0.30				0.30	0.30	0.30	22.0			
APR 16 70	THU	4		0.30	0.30	0.30	0.30				0.30	0.30	0.30	22.0			
APR 17 70	FRI	7		0.30	0.30	0.30	0.30				0.30	0.30	0.30	22.0			
APR 18 70	SAT	7		0.30	0.30	0.30	0.30				0.30	0.30	0.30	22.0			
APR 19 70	SUN	7		0.30	0.30	0.30	0.30				0.30	0.30	0.30	22.0			
APR 20 70	MON																
APR 21 70	TUE																
APR 22 70	WED																
APR 23 70	THU																
APR 24 70	FRI	7		0.30	0.30	0.30	0.30				0.30	0.30	0.30	28.0			
APR 25 70	SAT	7		0.30	0.30	0.30	0.30				0.30	0.30	0.30	28.0			
APR 26 70	SUN	7		0.30	0.30	0.30	0.30				0.30	0.30	0.30	28.0			
APR 27 70	MON	4															
APR 28 70	TUE	4															
APR 29 70	WED	4															
APR 30 70	THU	4															
MAY 1 70	FRI	7		0.30	0.30	0.30	0.30				0.30	0.30	0.30	27.0			
MAY 2 70	SAT	7		0.30	0.30	0.30	0.30				0.30	0.30	0.30	27.0			
MAY 3 70	SUN	7		0.30	0.30	0.30	0.30				0.30	0.30	0.30	27.0			
MAY 4 70	MON																
MAY 5 70	TUE																
MAY 6 70	WED	4		0.30	0.30	0.30	0.30				0.30	0.30	0.30	27.0			
MAY 7 70	THU	4		0.30	0.30	0.30	0.30				0.30	0.30	0.30	27.0			
MAY 8 70	FRI																
MAY 9 70	SAT																
MAY 10 70	SUN	6		0.30	0.30	0.30	0.30				0.30	0.30	0.30	27.0			
MAY 11 70	MON																
MAY 12 70	TUE	6		0.30	0.30	0.30	0.30				0.30	0.30	0.30	25.0			
MAY 13 70	WED																
MAY 14 70	THU																
MAY 15 70	FRI																
MAY 16 70	SAT																
MAY 17 70	SUN	6	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	22.0	24.0	25.0	25.0
MAY 18 70	MON																
MAY 19 70	TUE																
MAY 20 70	WED	6	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	22.0	24.0	24.0	24.0
MAY 21 70	THU	6	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	12.0	19.0	22.0	19.0
MAY 22 70	FRI																
MAY 23 70	SAT																
MAY 24 70	SUN	6	0.22	0.30	0.30	0.30	0.30	0.30	0.30	0.20	0.30	0.30	0.30	17.0	20.0	20.0	20.0
MAY 25 70	MON																

Date of Obsv	Day of Week	Samp Type	S-1 NO2	P-2 NO2	F-2 NO2	S-2 NO2	Inf NO3	P-1 NO3	F-1 NO3	S-1 NO3	P-2 NO3	F-2 NO3	S-2 NO3	Inf NH3	P-1 NH3	F-1 NH3	S-1 NH3
MAY 26 70	TUE	6	0.01	0.09	0.06	0.01	0.10	0.30	0.10	0.10	1.20		0.10	20.5	22.0	21.0	21.0
MAY 27 70	WED																
MAY 28 70	THU	6	0.01	0.04	0.09	0.01	0.10	0.50	0.30	0.10	0.10	0.10	0.10	19.5	24.0	25.0	25.5
MAY 29 70	FRI																
MAY 30 70	SAT																
MAY 31 70	SUN	6	0.05	0.01	0.26	0.21	0.10	0.90	0.50		0.10	0.40	0.40	21.5	21.0	21.5	22.0
JUN 1 70	MON																
JUN 2 70	TUE	6	0.85	0.06	0.18	0.14	0.05	0.03	1.20	0.60	0.05	0.60	0.20	15.0	16.5	15.0	16.0
JUN 3 70	WED																
JUN 4 70	THU	6	0.79	0.03	0.17	0.11	0.05	0.05	1.30	0.80	0.05	0.60	0.20	20.5	19.5	17.5	17.5
JUN 5 70	FRI																
JUN 6 70	SAT																
JUN 7 70	SUN	6	1.03	0.07	0.28	0.39	0.05	0.20	2.00	1.60	0.05	1.00	1.30	16.0	14.0	14.0	14.0
JUN 8 70	MON																
JUN 9 70	TUE	6	0.90	0.10	0.20	0.20	0.30	0.10	1.70	1.10	0.10	0.70	0.10	23.5	18.0	17.0	16.5
JUN 10 70	WED	9															
JUN 11 70	THU	9	0.60	0.10		0.10	0.20	0.10	1.10	0.80	0.10		0.10	23.5	16.0	15.0	15.0
JUN 12 70	FRI																
JUN 13 70	SAT																
JUN 14 70	SUN	6	1.01	0.10	0.34	0.22	0.30	0.30	2.40	1.50	0.30	1.60	0.90	26.5	18.0	18.0	18.0
JUN 15 70	MON	6															
JUN 16 70	TUE	6	0.55	0.10	0.12	0.10	0.10	0.10	1.30	0.50	0.10	0.80	0.20	25.5	21.0	21.0	21.0
JUN 17 70	WED	6															
JUN 18 70	THU	6	0.53	0.02	0.13	0.15	0.20	0.10	1.90	1.00	1.00	0.40	0.05	18.0	17.5	16.5	17.5
JUN 19 70	FRI																
JUN 20 70	SAT																
JUN 21 70	SUN	6	0.04	0.02	0.77	0.28			3.40	2.80	0.10	1.10	1.30	17.0	12.0	10.5	11.0
JUN 22 70	MON	6															
JUN 23 70	TUE	6	0.65	0.05	0.15	0.25	0.10	0.10	2.00	1.30	0.10	0.90	0.40	23.5	18.0	15.5	15.0
JUN 24 70	WED	6															
JUN 25 70	THU	6	0.60	0.05	0.10	0.15	0.20	0.10	1.90	1.60	0.10		0.20	21.0	15.0	14.0	14.0
JUN 26 70	FRI																
JUN 27 70	SAT																
JUN 28 70	SUN	6	1.40	0.10	0.30	0.30	0.50	0.90	4.40	3.20	0.30	1.40	1.40	28.5	15.5	13.5	13.5
JUN 29 70	MON																
JUN 30 70	TUE	6	1.00	0.05	0.20	0.15	0.20	0.40	4.10	4.00	0.10	0.50	0.60	23.0	11.0	9.0	9.0
JUL 1 70	WED	6															
JUL 2 70	THU	6		0.05	0.10	0.15	0.20	0.10	0.60		0.10	0.20	0.10	16.5	12.0	12.5	
JUL 3 70	FRI																
JUL 4 70	SAT																
JUL 5 70	SUN	6	0.67	0.18	0.38	0.42	0.20	0.23	1.85	0.73	0.12	1.92	1.78	19.5	14.5	13.5	14.5
JUL 6 70	MON	6															
JUL 7 70	TUE	6															
JUL 8 70	WED	6															
JUL 9 70	THU	6	0.23	0.01	0.03	0.05	0.60	0.90	6.00	5.30	0.40	0.90	1.20	22.5	12.0	10.0	10.0
JUL 10 70	FRI																
JUL 11 70	SAT																
JUL 12 70	SUN	6	0.26	0.06	0.09	0.10	0.10	6.00	12.10	10.60	1.00	3.60	3.80	15.0	9.0	7.0	7.5
JUL 13 70	MON	6															
JUL 14 70	TUE	6															
JUL 15 70	WED																
JUL 16 70	THU																
JUL 17 70	FRI																

Date of Obsv	Day of Week	Samp Type	S-1 NO2	P-2 NO2	F-2 NO2	S-2 NO2	Inf NO3	P-1 NO3	F-1 NO3	S-1 NO3	P-2 NO3	F-2 NO3	S-2 NO3	Inf NH3	P-1 NH3	F-1 NH3	S-1 NH3
JUL 18 70	SAT																
JUL 19 70	SUN	6															
JUL 20 70	MON	6															
JUL 21 70	MON																
JUL 22 70	TUE																
JUL 23 70	THU	6	0.08	0.17	0.32	0.42	0.20	0.10	0.20	0.10	0.20	1.20	1.00	26.5	21.5	21.0	20.5
JUL 24 70	THU																
JUL 25 70	FRI																
JUL 26 70	SUN	6	0.64	0.75	0.62	0.67	0.20	0.10	1.30	0.70	1.10	4.10	4.20	19.0	14.0	13.5	13.5
JUL 27 70	MON	6															
JUL 28 70	TUE	6	0.04	0.01	0.01	0.05	0.10	0.10	0.40	0.10	0.10	0.10	0.10	36.5	25.0	22.5	22.5
JUL 29 70	WED																
JUL 30 70	THU																
JUL 31 70	FRI																
AUG 1 70	SAT																
AUG 2 70	SUN																
AUG 3 70	MON																
AUG 4 70	TUE																
AUG 5 70	WED	6															
AUG 6 70	THU	6	0.25	0.05	0.15	0.25	0.10	0.10	0.90	0.40	0.10	1.90	1.60	25.0	21.0	19.5	20.0
AUG 7 70	FRI																
AUG 8 70	SAT																
AUG 9 70	SUN	6	0.25	0.05		0.45	0.10	0.10		0.80	0.10		2.50	23.0	20.0		19.5
AUG 10 70	MON	6															
AUG 11 70	TUE																
AUG 12 70	WED	6															
AUG 13 70	THU	6	0.39	0.01		0.29	0.09	0.09	0.47	0.11	0.09		1.21	19.5	19.5	17.5	18.0
AUG 14 70	FRI																
AUG 16 70	SUN	6	0.49	0.03		0.38	0.09	0.09	1.81	1.31	0.07		3.02	18.5	17.0	15.0	16.5
AUG 17 70	MON	6															
AUG 18 70	TUE	11	0.34	0.01	0.23	0.60	0.09	0.09	0.68	1.16	0.09	0.97	0.40	27.5	19.0	16.0	12.5
AUG 19 70	WED																
AUG 20 70	THU	6	0.40	0.03	0.27	0.44	0.20	0.20	1.60	1.30	0.20	1.70	1.70	23.5	18.5	17.5	17.5
AUG 21 70	FRI																
AUG 23 70	SUN																
AUG 24 70	MON	6															
AUG 25 70	TUE	6	0.32	0.05	0.42	0.46	0.20	0.10	2.40	2.10	0.10	3.60	2.30	23.5	15.0	14.0	13.0
AUG 26 70	WED	6															
AUG 27 70	THU	6	0.27	0.11	0.33	0.40	0.30	0.30	1.90	1.70	0.30	1.20	2.50	22.5	17.5	17.0	17.0
AUG 28 70	FRI																
AUG 29 70	SAT																
AUG 30 70	SUN	6	0.41		0.90	0.81	0.30	0.70	3.30	3.00		3.90	3.70	17.0	15.0	15.0	15.0
AUG 31 70	MON	6															
SEP 1 70	TUE	6	0.40	0.06	0.40	0.54	0.40	0.10	2.40	2.20	0.10	2.20	2.30	21.0	15.5	14.5	14.0
SEP 2 70	WED	6															
SEP 3 70	THU	6	0.06	0.01	0.13	0.21	0.10	0.10	0.10	0.10	0.10	0.40	0.40	22.5	20.0	22.0	18.0
SEP 6 70	SUN																
SEP 7 70	MON	6															
SEP 8 70	TUE	6															
SEP 8 70	TUE	10	0.23	0.18	0.04	0.07	0.10	0.10	0.40	0.30	0.20	0.20	0.10	22.0	19.5	17.5	15.0
SEP 9 70	WED																
SEP 10 70	THU	6															
SEP 10 70	THU	10	0.23	0.18	0.04	0.07	0.10	0.10	0.40	0.30	0.20	0.20	0.10	22.0	19.5	17.5	15.0

Date of Obsv	Day of Week	Samp Type	S-1 NO2	P-2 NO2	F-2 NO2	S-2 NO2	Inf NO3	P-1 NO3	F-1 NO3	S-1 NO3	P-2 NO3	F-2 NO3	S-2 NO3	Inf NH3	P-1 NH3	F-1 NH3	S-1 NH3
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SEP 11 70	FRI																
SEP 12 70	SAT																
SEP 13 70	SUN	6															
SEP 13 70	SUN	12	0.25	0.01	0.09	0.10	0.10	0.10	0.60	0.40	0.10	0.30	0.20	22.0	21.0	18.0	17.5
SEP 14 70	MON	6															
SEP 15 70	TUE	6															
SEP 15 70	TUE	12	0.25	0.01	0.09		0.10	0.10	0.60	0.40	0.10	0.30		22.0	21.0	18.0	17.5
SEP 16 70	WED	6															
SEP 17 70	THU	12	0.25	0.01	0.09	0.10	0.10	0.10	0.60	0.40	0.10	0.30	0.20	22.0	21.0	18.0	17.5
SEP 17 70	THU	6															
SEP 18 70	FRI																
SEP 19 70	SAT																
SEP 20 70	SUN	6															
SEP 20 70	SUN	12	0.07	0.01	0.04	0.02	0.10	0.10	0.30	0.10	0.10	0.10	0.10	23.5	22.0	22.5	22.0
SEP 21 70	MON	6															
SEP 22 70	TUE	6															
SEP 22 70	TUE	12	0.07	0.01	0.04	0.02	0.10	0.10	0.30	0.10	0.10	0.10	0.10	23.5	22.0	22.5	22.0
SEP 23 70	WED	6															
SEP 24 70	THU	12	0.07	0.01	0.04	0.02	0.10	0.10	0.30	0.10	0.10	0.10	0.10	23.5	22.0	22.5	22.0
SEP 24 70	THU	6															
SEP 25 70	FRI																
SEP 26 70	SAT																
SEP 27 70	SUN	6															
SEP 27 70	SUN	12	0.17	0.03	0.07	0.06	0.10	0.10	0.50	0.20	0.10	0.30	0.10	22.0	21.5	19.5	19.5
SEP 28 70	MON	6															
SEP 29 70	TUE	6															
SEP 29 70	TUE	12	0.17	0.03	0.07	0.06	0.10	0.10	0.50	0.20	0.10	0.30	0.10	22.0	21.5	19.5	19.5
SEP 30 70	WED	6															
OCT 1 70	THU	12	0.17	0.03	0.07	0.06	0.10	0.10	0.50	0.20	0.10	0.30	0.10	22.0	21.5	19.5	19.5
OCT 1 70	THU	6															
OCT 2 70	FRI																
OCT 3 70	SAT																
OCT 4 70	SUN	4	0.37	0.05	0.05	0.06	0.40	0.40	1.20	0.60	0.10	0.10	0.10	29.0	21.0	21.5	21.0
OCT 4 70	SUN	13															
OCT 5 70	MON	6															
OCT 6 70	TUE	6															
OCT 6 70	TUE	4	0.37	0.05	0.05	0.06	0.40	0.40	1.20	0.60	0.10	0.10	0.10	29.0	21.0	21.5	21.0
OCT 8 70	THU																
OCT 7 70	WED																
OCT 9 70	FRI																
OCT 10 70	SAT																
OCT 11 70	SUN																
OCT 12 70	MON																
OCT 13 70	TUE																
OCT 14 70	WED																
OCT 15 70	THU																
OCT 16 70	FRI																
OCT 17 70	SAT																
OCT 18 70	SUN	6															
OCT 18 70	SUN	12	0.48	0.40	0.25	0.16	0.20	0.90	2.50	2.40		0.60	0.40	25.5	19.0	19.0	18.5
OCT 19 70	MON	6															
OCT 20 70	TUE	12	0.48	0.40	0.25	0.16	0.20	0.90	2.50	2.40		0.60	0.40	25.5	19.0	19.0	18.5
OCT 20 70	TUE	6															

Date of Obsv	Day of Week	Samp Type	S-1 NO2	P-2 NO2	F-2 NO2	S-2 NO2	Inf NO3	P-1 NO3	F-1 NO3	S-1 NO3	P-2 NO3	F-2 NO3	S-2 NO3	Inf NH3	P-1 NH3	F-1 NH3	S-1 NH3
OCT 21 70	WED	6															
OCT 22 70	THU	6															
OCT 22 70	THU	12	0.48	0.40	0.25	0.16	0.20	0.90	2.50	2.40		0.60	0.40	25.5	19.0	19.0	18.5
OCT 23 70	FRI																
OCT 24 70	SAT																
OCT 25 70	SUN	13															
OCT 25 70	SUN	12	0.41	0.04	0.12	0.17	0.10	0.20	2.30	1.90	0.10	0.30	0.10	28.5	22.0	20.5	20.5
OCT 26 70	MON	6															
OCT 27 70	TUE	6															
OCT 27 70	TUE	12	0.41	0.04	0.12	0.17	0.10	0.20	2.30	1.90	0.10	0.30	0.10	28.5	22.0	20.5	20.5
OCT 28 70	WED	6															
OCT 29 70	THU	6															
OCT 29 70	THU	12	0.41	0.04	0.12	0.17	0.10	0.20	2.30	1.90	0.10	0.30	0.10	28.5	22.0	20.5	20.5
OCT 30 70	FRI																
OCT 31 70	SAT																
NOV 1 70	SUN	6															
NOV 1 70	SUN	10	0.49	0.14	0.18	0.24	0.10	0.60	2.60	2.70	0.30	0.40	0.50	22.5	16.5	15.5	16.0
NOV 2 70	MON	6															
NOV 3 70	TUE																
NOV 4 70	WED																
NOV 5 70	THU	6															
NOV 5 70	THU	10	0.49	0.14	0.18	0.24	0.10	0.60	2.60	2.70	0.30	0.40	0.50	22.5	16.5	15.5	16.0
NOV 6 70	FRI																
NOV 7 70	SAT																
NOV 8 70	SUN	6															
NOV 8 70	SUN	10	0.48	0.15	0.16	0.15	0.30	0.60	2.50	2.30	0.20	0.40	0.20	23.0	18.5	16.5	17.0
NOV 9 70	MON	6															
NOV 10 70	TUE	6															
NOV 10 70	TUE	10	0.48	0.15	0.16	0.15	0.30	0.60	2.50	2.30	0.20	0.40	0.20	23.0	18.5	16.5	17.0
NOV 11 70	WED	6															
NOV 12 70	THU																
NOV 13 70	FRI																
NOV 14 70	SAT																
NOV 15 70	SUN																
NOV 16 70	MON																
NOV 17 70	TUE																
NOV 18 70	WED																
NOV 19 70	THU																
NOV 20 70	FRI																
NOV 21 70	SAT																
NOV 22 70	SUN																
NOV 23 70	MON																
NOV 24 70	TUE	6	0.31	0.05	0.11	0.09	0.10	1.70	3.10	2.70	0.20	0.30	1.20	28.0	19.0	18.5	18.0
NOV 25 70	THU																
NOV 26 70	THU																
NOV 27 70	FRI																
NOV 28 70	SAT																
NOV 29 70	SUN	6															
NOV 30 70	MON	6															
DEC 1 70	TUE	6															
DEC 1 70	TUE	12	0.36	0.08	0.08	0.09	0.10	1.40	2.20	3.00	0.90	0.30	0.20	27.0	19.0	20.5	18.0
DEC 2 70	WED	6															
DEC 3 70	THU	6															

Date of Obsv	Day of Week	Samp Type	S-1 NO2	P-2 NO2	F-2 NO2	S-2 NO2	Inf NO3	P-1 NO3	F-1 NO3	S-1 NO3	P-2 NO3	F-2 NO3	S-2 NO3	Inf NH3	P-1 NH3	F-1 NH3	S-1 NH3
DEC 3 70	THU	12	0.36	0.08	0.08	0.09	0.10	1.40	2.20	3.00	0.90	0.30	0.20	27.0	19.0	20.5	18.0
DEC 4 70	FRI	99															
DEC 5 70	SAT	99															
DEC 6 70	SUN	6															
DEC 6 70	SUN	12	0.59	0.10	0.08	0.09	0.30	1.40	3.80	5.30	0.30	0.20	0.10	23.0	12.5	11.0	10.5
DEC 7 70	MON	99															
DEC 8 70	TUE	6															
DEC 8 70	TUE	12	0.59	0.10	0.08	0.09	0.30	1.40	3.80	5.30	0.30	0.20	0.10	23.0	12.5	11.0	10.5
DEC 9 70	WED	6															
DEC 10 70	THU	6															
DEC 10 70	THU	12		0.10	0.08	0.09	0.30	1.40	3.80		0.30	0.20	0.10	23.0	12.5	11.0	
DEC 11 70	FRI	99															
DEC 12 70	SAT	99															
DEC 13 70	SUN	6	0.57	0.04	0.02	0.03	0.10	1.70	3.60	3.90	0.10	0.10		23.5	15.5	12.5	13.5
DEC 14 70	MON	6															
DEC 15 70	TUE	6	0.50	0.04	0.02	0.02	0.10	1.10	3.00	3.30	0.20	0.10	0.10	27.5	16.5	14.0	14.0
DEC 16 70	WED	11															
DEC 17 70	THU	6	0.46	0.06	0.02	0.03	0.05	0.50	2.20	2.00	0.10	0.10	0.10	22.0	14.5	12.5	13.0
DEC 20 70	SUN	6	0.39	0.07	0.03	0.04	0.03	2.60	4.30	4.00	0.20	0.10	0.10	18.0	10.5	8.5	8.5
DEC 21 70	MON	6															
DEC 22 70	TUE	99															
DEC 23 70	WED	99															
DEC 24 70	THU	99															
DEC 25 70	FRI	99															
DEC 26 70	SAT	99															
DEC 27 70	SUN	6	0.34	0.06	0.11	0.26	0.01	4.50	5.70	5.80	0.30	0.20	0.20	17.0	9.5	5.0	5.0
DEC 28 70	MON	6															
DEC 29 70	TUE	6	0.37	0.08	0.04	0.02		2.90	4.90	4.80	0.10	0.10	0.03	24.0	12.0	10.0	9.5
DEC 30 70	WED	6															
DEC 31 70	THU	99															
JAN 1 71	FRI	99															
JAN 2 71	SAT	99															
JAN 3 71	SUN	6	0.38	0.06	0.14	0.14	0.70	2.70	3.60	3.90	0.40	0.80	0.30	21.5	14.0	12.0	11.5
JAN 4 71	MON	6															
JAN 5 71	TUE	6	0.19	0.04	0.19	0.04	0.30	0.30	0.20	1.00	0.30	1.30	0.20	18.5	14.0	17.5	13.0
JAN 6 71	WED	6															
JAN 7 71	THU	6	0.31	0.06	0.03	0.03	0.20	0.70	1.90	1.60	0.10	0.20	0.10	28.5	17.5	16.0	16.0
JAN 8 71	FRI	99															
JAN 9 71	SAT	99															
JAN 10 71	SUN	6	0.28	0.10	0.06	0.06	0.10	1.00	2.00	2.10	0.20	0.10	0.10	20.0	17.5	15.5	15.0
JAN 11 71	MON	6															
JAN 12 71	TUE	6	0.07		0.02	0.02	0.20	0.10	0.10	0.10		0.10	0.10	20.0	19.5	18.5	19.0
JAN 13 71	WED	6															
JAN 14 71	THU	6	0.08	0.08	0.02	0.03	0.10	0.10	0.10	0.10	0.10	0.10	0.10	23.0	20.5	20.0	20.5
JAN 15 71	FRI	99															
JAN 16 71	SAT	99															
JAN 17 71	SUN	6	0.13	0.06	0.03	0.03	0.10	0.10	1.20	1.00	0.10	0.10	0.10	21.0	17.5	17.5	17.0
JAN 18 71	MON	6															
JAN 19 71	TUE	6	0.03	0.01	0.02	0.01	0.10	0.10	0.10	0.10	0.10	0.10	0.10	24.0	23.0	22.0	21.5
JAN 20 71	WED	6															
JAN 21 71	THU	6	0.02	0.01	0.07	0.02	0.10	0.10	0.10	0.10	0.10	0.10	0.10	24.0	22.0	21.5	21.5
JAN 22 71	FRI	99															
JAN 23 71	SAT	99															

Date of Obsv	Day of Week	Samp Type	S-1 NO2	P-2 NO2	F-2 NO2	S-2 NO2	Inf NO3	P-1 NO3	F-1 NO3	S-1 NO3	P-2 NO3	F-2 NO3	S-2 NO3	Inf NH3	P-1 NH3	F-1 NH3	S-1 NH3
JAN 24 71	SUN	6	0.04	0.08	0.03	0.03	0.10	0.10	0.10	0.10	0.10	0.10	0.10	20.5	20.5	20.0	20.5
JAN 25 71	MON	6															
JAN 26 71	TUE	6	0.02	0.02	0.03	0.02	0.10	0.20	0.10	0.20	0.10	0.10	0.10	21.0	19.5	20.0	20.0
JAN 27 71	WED	6															
JAN 28 71	THU	6	0.02	0.04	0.03	0.02	0.10	0.10	0.10	0.10	0.10	0.10	0.10	21.5	20.5	20.0	21.0
JAN 29 71	FRI	99															
JAN 30 71	SAT	99															
JAN 31 71	SUN	99															
FEB 1 71	MON	6															
FEB 2 71	TUE	6	0.02	0.02	0.02	0.02	0.10	0.10	0.20	0.10	0.10	0.20	0.20	26.5	27.0	25.0	24.5
FEB 3 71	WED	6															
FEB 4 71	THU	6	0.01	0.01	0.02	0.02	0.10	0.10	0.10	0.10	0.10	0.10	0.20	22.5	23.5	24.5	22.0
FEB 5 71	FRI	99															
FEB 6 71	SAT	99															
FEB 7 71	SUN	6	0.10	0.10	0.13	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	15.0	18.0	17.0	17.5
FEB 8 71	MON	6															
FEB 9 71	TUE	6	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	17.0	17.0	16.5	17.5
FEB 10 71	WED	6															
FEB 11 71	THU	6	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	18.5	19.5	20.5	20.5
FEB 12 71	FRI	99															
FEB 13 71	SAT	99															
FEB 14 71	SUN	6	0.02	0.01	0.04	0.03	0.10	0.10	0.20	0.20	0.10	0.20	0.10	18.0	16.5	17.0	16.5
FEB 15 71	MON	6															
FEB 16 71	TUE	6	0.01	0.01	0.06	0.05	0.10	0.10	0.10	0.10	0.10	0.10	0.10	20.0	19.5	20.0	20.0
FEB 17 71	WED	6															
FEB 18 71	THU	6	0.01	0.01	0.01	0.01	0.10	0.10	0.10	0.10	0.10	0.10	0.10	21.5	21.5	20.0	21.0
FEB 19 71	FRI	99															
FEB 20 71	SAT	99															
FEB 21 71	SUN	6	0.01	0.01	0.01	0.01	0.10	0.10	0.10	0.10	0.10	0.10	0.10	23.0	23.0	22.0	22.5
FEB 22 71	MON	6															
FEB 23 71	TUE	6	0.01	0.01	0.01	0.01	0.10	0.10	0.10	0.10	0.10	0.10	0.10	22.5	21.5	22.0	22.5
FEB 24 71	WED	6															
FEB 25 71	THU	6	0.01	0.01	0.01	0.01	0.10	0.10	0.10	0.10	0.10	0.10	0.10	24.0	22.0	22.0	22.0
FEB 26 71	FRI	99															
FEB 27 71	SAT	99															
FEB 28 71	SUN	6	0.01	0.01	0.01	0.01	0.10	0.10	0.10	0.10	0.10	0.10	0.10	19.0	19.0	19.0	19.0
MAR 1 71	MON	6															
MAR 2 71	TUE	6	0.02	0.02	0.02	0.01	0.10	0.10	0.10	0.10	0.10	0.10	0.10	20.0	18.5	18.5	19.0
MAR 3 71	WED	6															
MAR 4 71	THU	6	0.01	0.01	0.01	0.01	0.10	0.10	0.10	0.10	0.10	0.10	0.10	16.0	15.5	13.5	14.5
MAR 5 71	FRI	99															
MAR 6 71	SAT	99															
MAR 7 71	SUN	6	0.02	0.04	0.03	0.02	0.10	0.10	0.10	0.10	0.10	0.10	0.10	18.9	18.8	18.6	19.0
MAR 8 71	MON	6															
MAR 9 71	TUE	6	0.01	0.01	0.01	0.01	0.10	0.10	0.10	0.10	0.10	0.10	0.10	18.7	24.9	22.3	22.3
MAR 10 71	WED	6															
MAR 11 71	THU	6															
MAR 12 71	FRI	99															
MAR 13 71	SAT	99															
MAR 14 71	SUN	6															
MAR 15 71	MON	6															
MAR 16 71	TUE	6															
MAR 17 71	WED	6															

Date of Obsv	Day of Week	Samp Type	S-1 NO2	P-2 NO2	F-2 NO2	S-2 NO2	Inf NO3	P-1 NO3	F-1 NO3	S-1 NO3	P-2 NO3	F-2 NO3	S-2 NO3	Inf NH3	P-1 NH3	F-1 NH3	S-1 NH3
MAR 18 71	THU	6															
MAR 19 71	FRI	99															
MAR 20 71	SAT	99															
MAR 21 71	SUN	6															
MAR 22 71	MON	6															
MAR 23 71	TUE	6	0.01	0.01	0.02	0.01	0.10	0.10	0.10	0.10	0.10	0.10	0.10	27.6	24.6	25.0	23.4
MAR 24 71	WED	6															
MAR 25 71	THU	6															
MAR 26 71	FRI	99															
MAR 27 71	SAT	99															
MAR 28 71	SUN	6															
MAR 29 71	MON	6															
MAR 30 71	TUE	6															
MAR 31 71	WED	6															
APR 1 71	THU	6															
APR 2 71	FRI	99															
APR 3 71	SAT	99															
APR 4 71	SUN	6															
APR 5 71	MON	6															
APR 6 71	TUE	6	0.10	0.01	0.13	0.12	0.10	0.10	0.10	0.10	0.10	0.10	0.10	21.0	19.5	20.5	20.5
APR 7 71	WED	6															
APR 8 71	THU	6															
APR 9 71	FRI	99															
APR 10 71	SAT	99															
APR 11 71	SUN	99															
APR 12 71	MON	6															
APR 13 71	TUE	6															
APR 14 71	WED	6															
APR 15 71	THU	6															
APR 16 71	FRI	99															
APR 17 71	SAT	99															
APR 18 71	SUN	6															
APR 19 71	MON	6															
APR 20 71	TUE	6															
APR 21 71	WED	6															
APR 22 71	THU	6	0.01	0.03	0.02	0.01	0.10	0.10	0.10	0.10	0.10	0.10	0.10	32.0	28.5	29.5	29.5
APR 23 71	FRI	99															
APR 24 71	SAT	99															
APR 25 71	SUN	6															
APR 26 71	MON	6															
APR 27 71	TUE	6															
APR 28 71	WED	6															
APR 29 71	THU	6															
APR 30 71	FRI	99															
MAY 1 71	SAT	99															
MAY 2 71	SUN	6															
MAY 3 71	MON	6															
MAY 4 71	TUE	6	0.01	0.01	0.01	0.01	0.20	0.20	0.20	0.10	0.20	0.20	0.10	25.5	27.0	27.5	28.5
MAY 5 71	WED	99															
MAY 6 71	THU	6															
MAY 7 71	FRI	99															
MAY 8 71	SAT	99															
MAY 9 71	SUN	6															

Date of Obsv	Day of Week	Samp Type	S-1 NO2	P-2 NO2	F-2 NO2	S-2 NO2	Inf NO3	P-1 NO3	F-1 NO3	S-1 NO3	P-2 NO3	F-2 NO3	S-2 NO3	Inf NH3	P-1 NH3	F-1 NH3	S-1 NH3
MAY 10 71	MON	99															
MAY 11 71	TUE	99															
MAY 12 71	WED	99															
MAY 13 71	THU	99															
MAY 14 71	FRI	99															
MAY 15 71	SAT	99															
MAY 16 71	SUN	6															
MAY 17 71	MON	6															
MAY 18 71	TUE	6															
MAY 19 71	WED	99															
MAY 20 71	THU	6															
MAY 21 71	FRI	99															
MAY 22 71	SAT	99															
MAY 23 71	SUN	6															
MAY 24 71	MON	6															
MAY 25 71	TUE	6															
MAY 26 71	WED	6															
MAY 27 71	THU	6															
MAY 28 71	FRI	99															
MAY 29 71	SAT	99															
MAY 30 71	SUN	99															
MAY 31 71	MON	6															
JUN 1 71	TUE	6															
JUN 2 71	WED	6															
JUN 3 71	THU	6															
JUN 4 71	FRI	99															
JUN 5 71	SAT	99															
JUN 6 71	SUN	6															
JUN 7 71	MON	6															
JUN 8 71	TUE	6															
JUN 9 71	WED	6															
JUN 10 71	THU	6															
JUN 11 71	FRI	99															
JUN 12 71	SAT	99															
JUN 13 71	SUN	6															
JUN 14 71	MON	6															
JUN 15 71	TUE	6															
JUN 16 71	WED	6															
JUN 17 71	THU	99															
JUN 18 71	FRI	99															
JUN 19 71	SAT	99															
JUN 20 71	SUN	99															
JUN 21 71	MON	99															
JUN 22 71	TUE	6															
JUN 23 71	WED	99															
JUN 24 71	THU	6															
JUN 25 71	FRI	99															
JUN 26 71	SAT	6															
JUN 27 71	SUN	99															
JUN 28 71	MON	6															
JUN 29 71	TUE	6															
JUN 30 71	WED	6															
JUL 1 71	THU	6															

Date of Obsv	Day of Week	Samp Type	S-1 NO2	P-2 NO2	F-2 NO2	S-2 NO2	Inf NO3	P-1 NO3	F-1 NO3	S-1 NO3	P-2 NO3	F-2 NO3	S-2 NO3	Inf NH3	P-1 NH3	F-1 NH3	S-1 NH3
JUL 2 71	FRI	99															
JUL 3 71	SAT	99															
JUL 4 71	SUN	99															
JUL 5 71	MON	6															
JUL 6 71	TUE	6															
JUL 7 71	WED	6															
JUL 8 71	THU	6	0.17	0.05	0.13	0.07	0.20	0.40	0.60	0.40	0.40	1.90	0.20	13.5	13.0	11.0	12.5
JUL 9 71	FRI	99															
JUL 10 71	SAT	6															
JUL 11 71	SUN	99															
JUL 12 71	MON	6															
JUL 13 71	TUE	6															
JUL 14 71	WED	6															
JUL 15 71	THU	6	0.22	0.21	0.27	0.40	0.20	0.30	1.60	0.30	0.90	2.70	2.30	18.0	18.0	15.5	16.0
JUL 16 71	FRI	99															
JUL 17 71	SAT	6															
JUL 18 71	SUN	99															
JUL 19 71	MON	6															
JUL 20 71	TUE	6															
JUL 21 71	WED	6															
JUL 22 71	THU	6	0.17	0.08	0.23		0.10	0.10	0.10	0.10	0.10	0.10		30.0	26.0		
JUL 23 71	FRI	99															
JUL 24 71	SAT	6															
JUL 25 71	SUN	99															
JUL 26 71	MON	6															
JUL 27 71	TUE	6															
JUL 28 71	WED	6															
JUL 29 71	THU	6															
JUL 30 71	FRI	99															
JUL 31 71	SAT	99															
AUG 1 71	SUN	99															
AUG 2 71	MON	6															
AUG 3 71	TUE	6															
AUG 4 71	WED	6															
AUG 5 71	THU	6	0.36	0.38	0.20	0.36	0.30	0.30	1.80	0.90	0.60	4.40	2.80	24.5	21.5	19.0	19.0
AUG 6 71	FRI	99															
AUG 7 71	SAT	99															
AUG 8 71	SUN	99															
AUG 9 71	MON	6															
AUG 10 71	TUE	6															
AUG 11 71	WED	6															
AUG 12 71	THU	6	0.23	0.40	0.25	0.42	0.10	0.10	2.80	1.60	1.00	4.20	3.60	15.5	18.0	16.0	14.5
AUG 13 71	FRI	99															
AUG 14 71	SAT	6															
AUG 15 71	SUN	99															
AUG 16 71	MON	6															
AUG 17 71	TUE	6	0.16	0.12		0.31	0.20	0.10	3.10	7.60	1.10		5.70	19.0	21.0	18.5	18.5
AUG 18 71	WED	6															
AUG 19 71	THU	6	0.20	0.46	0.29	0.45	0.20	0.10	1.80	2.30	1.10	6.50	5.00	16.5	18.5	11.0	16.0
AUG 20 71	FRI	99															
AUG 21 71	SAT	6															
AUG 22 71	SUN	99															
AUG 23 71	MON	6															

Date of Obsv	Day of Week	Samp Type	S-1 NO2	P-2 NO2	F-2 NO2	S-2 NO2	Inf NO3	P-1 NO3	F-1 NO3	S-1 NO3	P-2 NO3	F-2 NO3	S-2 NO3	Inf NH3	P-1 NH3	F-1 NH3	S-1 NH3
AUG 24 71	TUE	6	0.24	0.75	0.39	0.52	0.20	0.10	4.00	3.10	1.70	5.60	5.00	14.5	15.5	10.5	11.0
AUG 25 71	WED	6															
AUG 26 71	THU	6	0.22	0.10	0.12	0.38	0.20	0.20	2.80	2.10	0.50	4.50	2.80	19.5	19.5	14.5	15.0
AUG 27 71	FRI	99															
AUG 28 71	SAT	6															
AUG 29 71	SUN	99															
AUG 30 71	MON	6															
AUG 31 71	TUE	6	0.25	0.06	0.19	0.42	0.20	0.50	2.20	1.40	0.10	1.80	1.40	25.0	26.0	20.0	20.0
SEP 1 71	WED	6															
SEP 2 71	THU	6	0.18	0.04	0.18	0.23	0.30	0.30	1.30	0.40	0.40	1.40	0.50	30.5	30.0	25.0	26.0
SEP 3 71	FRI	99															
SEP 4 71	SAT	99															
SEP 5 71	SUN	99															
SEP 6 71	MON	99															
SEP 7 71	TUE	6	0.02	0.16	0.27	0.01	0.10	0.10	1.40	1.20	0.10	1.70	1.40	25.0	24.0	24.0	24.0
SEP 8 71	WED	6															
SEP 9 71	THU	6	0.27	0.05		0.28	2.10	0.60	0.10	0.10	1.50		0.20	31.5	28.0	26.0	26.5
SEP 10 71	FRI	99															
SEP 11 71	SAT	6															
SEP 12 71	SUN	99															
SEP 13 71	MON	6															
SEP 14 71	TUE	99															
SEP 15 71	WED	6															
SEP 16 71	THU	6	0.24	0.03	0.13	0.31	0.30	0.20	2.00	0.50	0.20	1.20	0.50	19.0	17.0	15.0	14.0
SEP 17 71	FRI	99															
SEP 18 71	SAT	6															
SEP 19 71	SUN	99															
SEP 20 71	MON	6															
SEP 21 71	TUE	6	0.25	0.03	0.11	0.18	0.10	0.20	0.70	1.50	0.20	0.60	0.30	19.5	17.5	18.5	15.0
SEP 22 71	WED	6															
SEP 23 71	THU	6	0.43	0.04		0.20	0.10	0.10	0.30	1.20	0.20		0.20	22.5	21.0	20.0	19.5
SEP 24 71	FRI	99															
SEP 25 71	SAT	6															
SEP 26 71	SUN	99															
SEP 27 71	MON	6															
SEP 28 71	TUE	99															
SEP 29 71	WED	99															
SEP 30 71	THU	6															
OCT 1 71	FRI	99															
OCT 2 71	SAT	6															
OCT 3 71	SUN	99															
OCT 4 71	MON	6															
OCT 5 71	TUE	6															
OCT 6 71	WED	6															
OCT 7 71	THU	99															
OCT 8 71	FRI	99															
OCT 9 71	SAT	99															
OCT 10 71	SUN	6															
OCT 11 71	MON	6															
OCT 12 71	TUE	6															
OCT 13 71	WED	6															
OCT 14 71	THU	6															
OCT 15 71	FRI	99															

Date of Obsv	Day of Week	Samp Type	S-1 NO2	P-2 NO2	F-2 NO2	S-2 NO2	Inf NO3	P-1 NO3	F-1 NO3	S-1 NO3	P-2 NO3	F-2 NO3	S-2 NO3	Inf NH3	P-1 NH3	F-1 NH3	S-1 NH3
OCT 16 71	SAT	6															
OCT 17 71	SUN	99															
OCT 18 71	MON	6															
OCT 19 71	TUE	6															
OCT 20 71	WED	6															
OCT 21 71	THU	6															
OCT 22 71	FRI	99															
OCT 23 71	SAT	6															
OCT 24 71	SUN	99															
OCT 25 71	MON	99															
OCT 26 71	TUE	99															
OCT 27 71	WED	99															
OCT 28 71	THU	99															
OCT 29 71	FRI	99															
OCT 30 71	SAT	99															
OCT 31 71	SUN	99															
NOV 1 71	MON	6															
NOV 2 71	TUE	6															
NOV 3 71	WED	6															
NOV 4 71	THU	99															
NOV 5 71	FRI	99															
NOV 6 71	SAT	99															
NOV 7 71	SUN	99															
NOV 8 71	MON	99															
NOV 9 71	TUE	99															
NOV 10 71	WED	6															
NOV 11 71	THU	6															
NOV 12 71	FRI	99															
NOV 13 71	SAT	6															
NOV 14 71	SUN	99															
NOV 15 71	MON	6															
NOV 16 71	TUE	6															
NOV 17 71	WED	6															
NOV 18 71	THU	6															
NOV 19 71	FRI	99															
NOV 20 71	SAT	6															
NOV 21 71	SUN	99															
NOV 22 71	MON	6															
NOV 23 71	TUE	6															
NOV 24 71	WED	99															
NOV 25 71	THU	99															
NOV 26 71	FRI	99															
NOV 27 71	SAT	6															
NOV 28 71	SUN	99															
NOV 29 71	MON	6															
NOV 30 71	TUE	15															
DEC 1 71	WED	15															
DEC 2 71	THU	15															
DEC 3 71	FRI	99															
DEC 4 71	SAT	15															
DEC 5 71	SUN	99															
DEC 6 71	MON	15															
DEC 7 71	TUE	15															

Date of Obsv	Day of Week	Samp Type	S-1 NO2	P-2 NO2	F-2 NO2	S-2 NO2	Inf NO3	P-1 NO3	F-1 NO3	S-1 NO3	P-2 NO3	F-2 NO3	S-2 NO3	Inf NH3	P-1 NH3	F-1 NH3	S-1 NH3
DEC 8 71	WED	15															
DEC 9 71	THU	15															
DEC 10 71	FRI	99															
DEC 11 71	SAT	15															
DEC 12 71	SUN	99															
DEC 13 71	MON	15															
DEC 14 71	TUE	15															
DEC 15 71	WED	15															
DEC 17 71	FRI	99															
DEC 18 71	SAT	15															
DEC 19 71	SUN	99															
DEC 20 71	MON	15															
DEC 21 71	TUE	99															
DEC 22 71	WED	99															
DEC 23 71	THU	99															
DEC 24 71	FRI	99															
DEC 25 71	SAT	99															
DEC 26 71	SUN	99															
DEC 27 71	MON	99															
DEC 28 71	TUE	15															
DEC 29 71	WED	15															
DEC 30 71	THU	15															
DEC 31 71	FRI	99															
JAN 1 72	SAT	99															
JAN 2 72	SUN	99															
JAN 3 72	MON	15															
JAN 4 72	TUE	15															
JAN 5 72	WED	15															
JAN 6 72	THU	15															
JAN 7 72	FRI	99															
JAN 8 72	SAT	15															
JAN 9 72	SUN	99															
JAN 10 72	MON	15															
JAN 11 72	TUE	15	0.09	0.01	0.11	0.06	0.10	0.10		0.80	0.20	0.40	0.50	18.5	18.0		18.0
JAN 12 72	WED	15															
JAN 13 72	THU	99															
JAN 14 72	FRI	99															
JAN 15 72	SAT	15															
JAN 16 72	SUN	99															
JAN 17 72	MON	15															
JAN 18 72	TUE	15	0.11	0.05	0.07	0.07	0.40	0.60	1.30	1.00	0.50	0.70	0.70	24.0	22.5	22.5	23.0
JAN 19 72	WED	15															
JAN 20 72	THU	15	0.12	0.01	0.03	0.10	0.20	0.10	0.90	1.20	0.10	0.30	0.40	23.5	23.5	23.5	23.0
JAN 21 72	FRI	99															
JAN 22 72	SAT	15															
JAN 23 72	SUN	99															
JAN 24 72	MON	15															

Date of Obsv	Day of Week	Samp Type	P-2 NH3	F-2 NH3	S-2 NH3	Inf KJLD N	P-1 KJLD N	F-1 KJLD N	S-1 KJLD N	P-2 KJLD N	F-2 KJLD N	S-2 KJLD N	Inf Totl IN P	P-1 Totl IN P	F-1 Totl IN P	S-1 Totl IN P	P-2 Totl IN P
NOV 19 69	WED	6															
NOV 19 69	WED	4															
NOV 20 69	THU	6															
NOV 20 69	THU	4															
NOV 21 69	FRI	6															
NOV 21 69	FRI	7	26.2	27.9	26.4	42.0	37.8	36.8	37.5	37.8	35.0	35.9					
NOV 22 69	SAT	4															
NOV 22 69	SAT	7	26.2	27.9	26.4	42.0	37.8	36.8	37.5	37.8	35.0	35.9					
NOV 23 69	SUN	4															
NOV 23 69	SUN	7	26.2	27.9	26.4	42.0	37.8	36.8	37.8	37.8	35.0	35.9					
NOV 24 69	MON	6															
NOV 24 69	MON	4	25.2	34.6	24.8	43.5	37.4	33.8	34.3	37.0	35.0	33.3					
NOV 25 69	TUE	6															
NOV 25 69	TUE	4	25.2	24.6	24.8	43.5	37.4	33.8	34.3	37.0	35.0	33.3					
NOV 26 69	WED																
NOV 27 69	THU																
NOV 28 69	FRI																
NOV 29 69	SAT	4	22.2	21.6	22.0	42.6	33.3	31.0	32.0	32.0	29.8	29.0					
NOV 30 69	SUN	4	22.2	21.6	22.0	42.6	33.3	31.0	32.0	32.0	29.8	29.0					
DEC 1 69	MON	6															
DEC 1 69	MON	4	28.6	28.8	28.6	47.3	41.0	38.3	37.7	41.0	36.7	35.7					
DEC 2 69	TUE	6															
DEC 2 69	TUE	4	28.6	28.8	28.6	47.3	41.0	38.3	37.7	41.0	36.7	35.7					
DEC 3 69	WED	6															
DEC 3 69	WED	4	31.5	27.2	28.9	46.3	38.7	36.7	38.7	40.3	36.3	36.3					
DEC 4 69	THU	6															
DEC 4 69	THU	4	31.5	27.2	28.9	46.3	38.7	36.7	38.7	40.3	36.3	36.3					
DEC 5 69	FRI	6															
DEC 5 69	FRI	7	25.0	25.0	24.8	41.0	36.3	33.0	34.0	36.3	33.0	32.0					
DEC 6 69	SAT	4															
DEC 6 69	SAT	7	25.0	25.0	24.8	41.0	36.3	33.0	34.0	36.3	33.0	32.0					
DEC 7 69	SUN	4															
DEC 7 69	SUN	7	25.0	25.0	24.8	41.0	36.3	33.0	34.0	36.3	33.0	32.0					
DEC 8 69	MON	6															
DEC 8 69	MON	4	24.8	24.2	24.4	47.7	38.3	32.7	33.7	36.7	32.3	32.0					
DEC 9 69	TUE	6															
DEC 9 69	TUE	4	24.8	24.2	24.4	47.8	38.3	37.7	33.7	36.7	32.3	32.0					
DEC 10 69	WED	6															
DEC 10 69	WED	4	23.2	22.6	21.8	48.7	34.7	31.8	30.7	34.0	32.0						
DEC 11 69	THU	6															
DEC 11 69	THU	4	23.2	23.6	21.8	48.7	34.7	31.8	30.7	34.0	32.0						
DEC 12 69	FRI	7	25.1	25.0	25.0	36.7	32.0	28.3	29.7	33.0	30.0	29.7					
DEC 12 69	FRI	6															
DEC 13 69	SAT	7	25.1	25.0	25.0	36.7	32.0	28.3	29.7	33.0	30.0	29.7					
DEC 13 69	SAT	4															
DEC 14 69	SUN	7	25.1	25.0	25.0	36.7	32.0	28.3	29.7	33.0	30.0	29.7					
DEC 14 69	SUN	4															
DEC 15 69	MON	4															
DEC 15 69	MON	6															
DEC 16 69	TUE	6															
DEC 16 69	TUE	4															
DEC 17 69	WED	6															
DEC 17 69	WED	4															

Date of Obsv	Day of Week	Samp Type	P-2 NH3	F-2 NH3	S-2 NH3	Inf KJLD N	P-1 KJLD N	F-1 KJLD N	S-1 KJLD N	P-2 KJLD N	F-2 KJLD N	S-2 KJLD N	Inf Totl IN P	P-1 Totl IN P	F-1 Totl IN P	S-1 Totl IN P	P-2 Totl IN P
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DEC 18 69	THU	6															
DEC 18 69	THU	4															
DEC 19 69	FRI																
DEC 20 69	SAT																
DEC 21 69	SUN																
DEC 22 69	MON																
DEC 23 69	TUE																
DEC 24 69	WED																
DEC 25 69	THU																
DEC 26 69	FRI																
DEC 27 69	SAT																
DEC 28 69	SUN																
DEC 29 69	MON	6															
DEC 29 69	MON	4															
DEC 30 69	TUE	6															
DEC 30 69	TUE	4															
JAN 1 70	THU																
JAN 2 70	FRI																
JAN 5 70	MON																
JAN 6 70	TUE																
JAN 7 70	WED																
JAN 8 70	THU																
JAN 9 70	FRI																
JAN 10 70	SAT																
JAN 11 70	SUN																
JAN 12 70	MON																
JAN 13 70	TUE																
JAN 14 70	WED																
JAN 15 70	THU																
JAN 16 70	FRI																
JAN 17 70	SAT	4															
JAN 18 70	SUN	4															
JAN 19 70	MON	4	22.8	23.0	22.2	33.6	31.2	30.8	30.8	32.4	30.8	29.6	9.3	8.7	9.6	9.2	10.0
JAN 20 70	TUE	4	22.8	23.0	22.2	33.6	31.2	30.8	30.8	32.4	30.8	29.6	9.3	8.7	9.6	9.2	10.0
JAN 21 70	WED	4	23.4	24.6	23.8	32.0	29.6	26.8	28.0	32.0	30.8	30.8	8.5	9.3	7.8	9.2	8.4
JAN 22 70	THU	4	23.4	24.6	23.8	32.0	29.6	26.8	28.0	32.0	30.8	30.8	8.5	9.3	7.8	9.2	8.4
JAN 23 70	FRI	7	21.2	22.4	21.4	14.0	30.8	30.8	32.0	30.8	32.0	26.8	8.3	12.0	9.1	9.6	9.2
JAN 24 70	SAT	7	21.2	22.4	21.4	14.0	30.8	30.8	32.0	30.8	32.0	26.8	8.3	12.0	9.1	9.6	9.2
JAN 25 70	SUN	7	21.2	22.4	21.4	14.0	30.8	30.8	32.0	30.8	32.0	26.8	8.3	12.0	9.1	9.6	9.2
JAN 26 70	MON	4	24.0	30.2	24.8	42.4	39.6	34.8	29.6	36.0	36.0	32.0	11.8	9.6	12.2	9.9	10.7
JAN 27 70	TUE	4	24.0	30.2	24.8	42.4	39.6	34.8	29.6	36.0	36.0	32.0	11.8	9.6	12.2	9.9	10.7
JAN 28 70	WED	4	24.2	25.8	24.8	37.6	33.2	40.0	34.8	36.0	36.0	32.0	10.3	10.2	11.0	11.1	9.7
JAN 29 70	THU	4	24.2	25.8	24.8	37.6	33.2	40.0	34.8	36.0	36.0	32.0	10.3	10.2	11.0	11.1	9.7
JAN 30 70	FRI	7	20.2	20.8	20.2	26.8	24.0	24.0	28.0	28.0	25.6	22.8	8.3	8.5	8.4	8.4	8.9
JAN 31 70	SAT	7	20.2	20.8	20.2	26.8	24.0	24.0	28.0	28.0	25.6	22.8	8.3	8.5	8.4	8.4	8.9
FEB 1 70	SUN	7	20.2	20.8	20.2	26.8	24.0	24.0	28.0	28.0	25.6	22.8	8.3	8.5	8.4	8.4	8.9
FEB 2 70	MON	4	16.0	16.6	16.8		20.4	22.8	19.2	22.8	20.4	20.4	6.4	6.4	6.7	6.8	6.8
FEB 3 70	TUE	4	16.0	16.6	16.8		20.4	22.8	19.2	22.8	20.4	20.4	6.4	6.4	6.7	6.8	6.8
FEB 4 70	WED	4	22.8	22.8	23.4	36.0	34.0	33.0	35.0	35.0	31.0	31.2	7.5	8.2	8.2	8.6	7.8
FEB 5 70	THU	4	22.8	22.8	23.4	36.0	34.0	33.0	35.0	35.0	31.0	31.2	7.5	8.2	8.2	8.6	7.8
FEB 6 70	FRI																
FEB 7 70	SAT	4	22.8	22.4	21.8	35.6	34.4	32.8	30.8	36.0	32.4	32.0	8.5	9.7	10.7	9.8	10.5
FEB 8 70	SUN	4	22.8	22.4	21.8	35.6	34.4	32.8	30.8	36.0	32.4	32.0	8.5	9.7	10.7	9.8	10.5

Date of Obsv	Day of Week	Samp Type	P-2 NH3	F-2 NH3	S-2 NH3	Inf KJLD N	P-1 KJLD N	F-1 KJLD N	S-1 KJLD N	P-2 KJLD N	F-2 KJLD N	S-2 KJLD N	Inf Totl IN P	P-1 Totl IN P	F-1 Totl IN P	S-1 Totl IN P	P-2 Totl IN P
FEB 9 70	MON	4	23.8	23.6	23.2	41.0	34.8	36.0	33.6	36.4	35.0	33.6	9.2	9.5	9.8	9.7	9.7
FEB 10 70	TUE	4	23.8	23.6	23.2	41.0	34.8	36.0	33.6	36.4	35.0	33.6	9.2	9.5	9.8	9.7	9.7
FEB 11 70	WED	4	23.4	23.8	23.8	42.6	37.6	36.4	56.8	43.4	41.4	41.8	9.5	9.9	10.6	10.0	11.0
FEB 12 70	THU	4	23.4	23.8	23.8	42.6	37.6	36.4	56.8	43.4	41.4	41.8	9.5	9.9	10.6	10.0	11.0
FEB 13 70	FRI	7	22.4	22.8	22.0	42.6	40.4	40.8	36.8	41.6	39.6	37.6	9.5	10.8	10.8	10.7	11.7
FEB 14 70	SAT	7	22.4	22.8	22.0	42.6	40.4	40.8	36.8	41.6	39.6	37.6	9.5	10.8	10.8	10.7	11.7
FEB 15 70	SUN	7	22.4	22.8	22.0	42.6	40.4	40.8	36.8	41.6	39.6	37.6	9.5	10.8	10.8	10.7	11.7
FEB 16 70	MON	4	16.8	16.6	16.6	32.0	32.2	30.6	29.6	30.0	27.0	26.2	5.6	6.8	5.8	6.6	6.0
FEB 17 70	TUE	4	16.8	16.6	16.6	32.0	32.2	30.6	29.6	30.0	27.0	26.2	5.6	6.8	5.8	6.6	6.0
FEB 18 70	WED	4	17.8	17.2	17.2	30.2	28.2	27.2	26.0	28.0	26.6	25.8	6.9	7.0	8.1	6.7	7.8
FEB 19 70	THU	4	17.8	17.2	17.2	30.2	28.2	27.2	26.0	28.0	26.6	25.8	6.9	7.0	8.1	6.7	7.8
FEB 20 70	FRI	7	21.2	20.8	20.6	34.6	30.0	29.6	27.4	33.0	30.8	30.0	8.7	9.2	8.5	9.2	9.0
FEB 21 70	SAT	7	21.2	20.8	20.6	34.6	30.0	29.6	27.4	33.0	30.8	30.0	8.7	9.2	8.5	9.2	9.0
FEB 22 70	SUN	7	21.2	20.8	20.6	34.6	30.0	29.6	27.4	33.0	30.8	30.0	8.7	9.2	8.5	9.2	9.0
FEB 23 70	MON	4	20.8	21.2	21.6	38.6	36.6	35.4	35.4	36.6	36.2	35.2	10.3	10.0	11.0	9.8	10.5
FEB 24 70	TUE	4	20.8	21.2	21.6	38.6	36.6	35.4	35.4	36.6	36.2	35.2	10.3	10.0	11.0	9.8	10.5
FEB 25 70	WED	4	19.8	20.8	20.4	36.0	32.0	30.6	29.4	32.4	32.2	33.6	8.1	8.3	8.4	8.4	8.0
FEB 26 70	THU	4	19.8	20.8	20.4	36.0	32.0	30.6	29.4	32.4	32.2	33.6	8.1	8.3	8.4	8.4	8.0
FEB 27 70	FRI																
FEB 28 70	SAT																
MAR 1 70	SUN																
MAR 2 70	MON	4	22.8	22.2	22.8	46.2	38.6	39.4	39.8	40.4	39.0	39.2	8.2	9.6	10.5	10.7	10.9
MAR 3 70	TUE	4	22.8	22.2	22.8	46.2	38.6	39.4	39.8	40.4	39.0	39.2	8.2	9.6	10.5	10.7	10.9
MAR 4 70	WED	4	18.0	17.8	17.0	37.2	32.8	34.0	32.0	31.6	31.0	29.6	9.3	7.3	7.7	7.9	6.6
MAR 5 70	THU	4	18.0	17.8	17.0	37.2	32.8	34.0	32.0	31.6	31.0	29.6	9.3	7.3	7.7	7.9	6.6
MAR 6 70	FRI	7	26.8	23.8	22.4	32.4	29.2	27.8	27.2	30.4	29.6	28.4	8.2	7.6	7.7	7.7	8.3
MAR 7 70	SAT	7	26.8	23.8	22.4	32.4	29.2	27.8	27.2	30.4	29.6	28.4	8.2	7.6	7.7	7.7	8.3
MAR 8 70	SUN	7	26.8	23.8	22.4	32.4	29.2	27.8	27.2	30.4	29.6	28.4	8.2	7.6	7.7	7.7	8.3
MAR 9 70	MON	4	22.6	24.6	21.4	41.4	38.0	36.2	36.0	37.0	39.0	37.2	9.2	9.4	9.3	10.1	8.9
MAR 10 70	TUE	4	22.6	24.6	21.4	41.4	38.0	36.2	36.0	37.0	39.0	37.2	9.2	9.4	9.3	10.1	8.9
MAR 11 70	WED	4	28.0	30.0	30.0	31.0	33.0	35.0	34.0	36.0	38.0	35.0	7.5	9.0	9.5	9.8	9.3
MAR 12 70	THU	4	28.0	30.0	30.0	31.0	33.0	35.0	34.0	36.0	38.0	35.0	7.5	9.0	9.5	9.8	9.3
MAR 13 70	FRI	4	22.6	22.6	21.4	42.0	30.0	29.0	28.0	33.4	33.0	30.0	7.7	8.4	8.5	8.3	8.8
MAR 14 70	SAT	4	22.6	22.6	21.4	42.0	30.0	29.0	28.0	33.4	33.0	30.0	7.7	8.4	8.5	8.3	8.8
MAR 15 70	SUN																
MAR 16 70	MON	4	28.6	28.0	27.4	51.0	36.0	36.0	33.0	40.0	42.0	38.0	10.3	9.9	9.9	9.9	10.4
MAR 17 70	TUE	4	28.6	28.0	27.4	51.0	36.0	36.0	33.0	40.0	42.0	38.0	10.3	9.9	9.9	9.9	10.4
MAR 18 70	WED	4	29.0	28.6	28.6	38.0	36.0	41.0	35.0	40.0	38.0	36.0	8.5	9.6	10.3	9.8	9.4
MAR 19 70	THU	4	29.0	28.6	28.6	38.0	36.0	41.0	35.0	40.0	38.0	36.0	8.5	9.6	10.3	9.8	9.4
MAR 20 70	FRI																
MAR 21 70	SAT																
MAR 22 70	SUN																
MAR 23 70	MON	4	22.0	22.0	21.4	29.0	32.0	33.0	28.6	39.0	41.0	38.0	7.9	8.9	8.8	8.4	8.9
MAR 24 70	TUE	4	22.0	22.0	21.4	29.0	32.0	33.0	28.6	39.0	41.0	38.0	7.9	8.9	8.8	8.4	8.9
MAR 25 70	WED	4	17.2	16.4	16.4	37.0	34.0	45.0	43.0	32.0	36.0	30.0	8.5	9.3	12.7	9.4	8.9
MAR 26 70	THU	4	17.2	16.4	16.4	37.0	34.0	45.0	43.0	32.0	36.0	30.0	8.5	9.3	12.7	9.4	8.9
MAR 27 70	FRI																
MAR 28 70	SAT																
MAR 29 70	SUN																
MAR 30 70	MON	4	19.4	19.0	20.0	32.0	31.0	28.0	26.0	34.0	31.4	30.0	8.6	8.8	8.7	8.6	8.3
MAR 31 70	TUE	4	19.4	19.0	20.0	32.0	31.0	28.0	26.0	34.0	31.4	30.0	8.6	8.8	8.7	8.6	8.3
APR 1 70	WED																
APR 2 70	THU																

Date of Obsv	Day of Week	Samp Type	P-2 NH3	F-2 NH3	S-2 NH3	Inf KJLD N	P-1 KJLD N	F-1 KJLD N	S-1 KJLD N	P-2 KJLD N	F-2 KJLD N	S-2 KJLD N	Inf Totl IN P	P-1 Totl IN P	F-1 Totl IN P	S-1 Totl IN P	P-2 Totl IN P
--- -- --	---	--	--.-	--.-	--.-	--.-	--.-	--.-	--.-	--.-	--.-	--.-	--.-	--.-	--.-	--.-	--.-
APR 3 70	FRI	7	21.4	22.0	22.0	36.0	29.0	28.0	24.6	33.0	36.0	32.0	7.8	8.5	8.7	8.6	8.4
APR 4 70	SAT	7	21.4	22.0	22.0	36.0	29.0	28.0	24.6	33.0	36.0	32.0	7.8	8.5	8.7	8.6	8.4
APR 5 70	SUN	7	21.4	22.0	22.0	36.0	29.0	28.0	24.6	33.0	36.0	32.0	7.8	8.5	8.7	8.6	8.4
APR 6 70	MON	4	24.0	23.0	23.4	37.0	35.0	40.0	35.4	36.0	39.0	35.0	8.7	9.7	11.0	10.4	9.6
APR 7 70	TUE	4	24.0	23.0	23.4	37.0	35.0	40.0	35.4	36.0	39.0	35.0	8.7	9.7	11.0	10.4	9.6
APR 8 70	WED	4															
APR 9 70	THU	4															
APR 10 70	FRI	7															
APR 11 70	SAT	7															
APR 12 70	SUN	7															
APR 13 70	MON																
APR 14 70	TUE																
APR 15 70	WED	4	23.5	23.0	23.0	35.5				34.5	32.0	37.0	7.6				7.8
APR 16 70	THU	4	23.5	23.0	23.0	35.5				34.5	32.0	37.0	7.6				7.8
APR 17 70	FRI	7	24.0	23.5	23.5	33.5				36.0	39.5	36.5	7.6				8.8
APR 18 70	SAT	7	24.0	23.5	23.5	33.5				36.0	39.5	36.5	7.6				8.8
APR 19 70	SUN	7	24.0	23.5	23.5	33.5				36.0	39.5	36.5	7.6				8.8
APR 20 70	MON																
APR 21 70	TUE																
APR 22 70	WED																
APR 23 70	THU																
APR 24 70	FRI	7	28.6	27.5	26.5	43.5				43.0	43.0	38.5	9.2				10.3
APR 25 70	SAT	7	28.6	27.5	26.5	43.5				43.0	43.0	38.5	9.2				10.3
APR 26 70	SUN	7	28.6	27.5	26.5	43.5				43.0	43.0	38.5	9.2				10.3
APR 27 70	MON	4															
APR 28 70	TUE	4															
APR 29 70	WED	4															
APR 30 70	THU	4															
MAY 1 70	FRI	7	28.0	28.0	28.0	39.0				35.0	35.0	39.0	6.8				8.0
MAY 2 70	SAT	7	28.0	28.0	28.0	39.0				35.0	35.0	39.0	6.8				8.0
MAY 3 70	SUN	7	28.0	28.0	28.0	39.0				35.0	35.0	39.0	6.8				8.0
MAY 4 70	MON																
MAY 5 70	TUE																
MAY 6 70	WED	4	27.0	27.0	27.0	35.0				36.0	34.0	33.0	6.9				7.7
MAY 7 70	THU	4	27.0	27.0	27.0	35.0				36.0	34.0	33.0	6.9				7.7
MAY 8 70	FRI																
MAY 9 70	SAT																
MAY 10 70	SUN	6	26.0	26.0	25.0	39.0				34.0	40.0	31.0	8.2				8.3
MAY 11 70	MON																
MAY 12 70	TUE	6	25.0	26.0	25.0	38.0				29.0	32.0	31.0	7.7				8.2
MAY 13 70	WED																
MAY 14 70	THU																
MAY 15 70	FRI																
MAY 16 70	SAT																
MAY 17 70	SUN	6	24.0	26.0	26.0	32.0	28.0	29.0	29.0	28.0	31.0	31.0	7.4	8.4	8.9	8.9	8.9
MAY 18 70	MON																
MAY 19 70	TUE																
MAY 20 70	WED	6	23.0	23.0	23.0	32.5	31.0	30.0	30.0	29.5	28.0	27.5	8.8	9.0	9.6	9.8	10.0
MAY 21 70	THU	6	19.0	18.0	19.0	27.0	26.5	25.5	26.0	25.0	26.0	24.5	8.4	9.1	9.7	9.8	9.7
MAY 22 70	FRI																
MAY 23 70	SAT																
MAY 24 70	SUN	6	20.0	20.0	19.0	29.0	25.5	24.0	22.0	25.0	23.5	22.0	8.1	9.2	8.7	8.7	9.4
MAY 25 70	MON																

Date of Obsv	Day of Week	Samp Type	P-2 NH3	F-2 NH3	S-2 NH3	Inf KJLD N	P-1 KJLD N	F-1 KJLD N	S-1 KJLD N	P-2 KJLD N	F-2 KJLD N	S-2 KJLD N	Inf Totl IN P	P-1 Totl IN P	F-1 Totl IN P	S-1 Totl IN P	P-2 Totl IN P
MAY 26 70	TUE	6	21.0	22.0	21.0	22.5	21.0	22.0	20.5	25.0	25.5	22.0	9.1	10.0	9.1	10.3	9.4
MAY 27 70	WED																
MAY 28 70	THU	6	21.5	22.0	22.0	27.5	26.0	27.0	26.5	23.0	22.5	23.0	10.5	11.0	11.1	11.1	11.3
MAY 29 70	FRI																
MAY 30 70	SAT																
MAY 31 70	SUN	6	21.5	22.5	22.5	34.5	24.0	22.5	22.5	22.5	23.5	22.5	8.5	10.4	10.7	10.7	10.3
JUN 1 70	MON																
JUN 2 70	TUE	6	17.5	15.5	17.0	27.0	22.0	20.5	23.5	24.0	23.5	23.0	8.9	10.2	10.1	9.9	10.5
JUN 3 70	WED																
JUN 4 70	THU	6	22.0	19.5	20.0	39.0	26.0	22.0	22.0	27.0	26.0	28.5	9.1	10.5	10.2	10.3	10.9
JUN 5 70	FRI																
JUN 6 70	SAT																
JUN 7 70	SUN	6	17.0	17.0	17.5	30.5	22.5	20.0	22.5	22.0	23.0	23.0	7.6	9.7	10.4	9.5	10.3
JUN 8 70	MON																
JUN 9 70	TUE	6	23.0	19.5	20.5	24.5	23.5	20.0	16.5	27.0	22.5	24.5	9.3	10.6	10.2	10.2	10.4
JUN 10 70	WED	9															
JUN 11 70	THU	9	19.0		18.5	37.5	21.5	19.5	16.0	25.0		22.0	10.0	9.4	9.6	9.5	9.7
JUN 12 70	FRI																
JUN 13 70	SAT																
JUN 14 70	SUN	6	22.5	22.0	23.0	39.0	23.0	22.0	20.5	27.0	24.0	25.5	8.7	9.5	9.9	10.1	9.2
JUN 15 70	MON	6															
JUN 16 70	TUE	6	24.0	23.0	24.0	38.0	26.5	24.0	24.0	30.0	27.0	27.5	8.5	9.7	10.6	10.0	10.4
JUN 17 70	WED	6															
JUN 18 70	THU	6	19.0	18.5	19.0	28.5	23.5	22.5	21.0	27.5	24.0	24.5	8.3	9.4	10.2	9.8	9.2
JUN 19 70	FRI																
JUN 20 70	SAT																
JUN 21 70	SUN	6	13.5	14.0	13.5	28.5	17.5	16.5	15.5	21.0	21.0	18.0	7.4	8.5	9.3	9.5	9.0
JUN 22 70	MON	6															
JUN 23 70	TUE	6	21.0	18.5	20.0	38.5	28.5	21.0	19.0	28.0	23.5	23.5	9.6	8.6	8.4	8.4	9.0
JUN 24 70	WED	6															
JUN 25 70	THU	6	18.0	18.5	17.5	33.5	30.5	17.5	18.0		20.5		9.6	8.0	8.8	8.0	8.0
JUN 26 70	FRI																
JUN 27 70	SAT																
JUN 28 70	SUN	6	20.0	20.0	20.5	38.0	23.5	21.5	21.0	28.0	27.5	26.0	8.6	10.1	10.6	10.7	10.2
JUN 29 70	MON																
JUN 30 70	TUE	6	18.5	17.0	17.5	34.0	18.5	15.5	15.0	26.0	23.0	21.5	9.4	10.0	10.3	10.3	10.5
JUL 1 70	WED	6															
JUL 2 70	THU	6	14.5	13.5	14.0	26.5	8.0	7.0		10.0	8.0	7.0	9.1	10.1	10.0		10.0
JUL 3 70	FRI																
JUL 4 70	SAT																
JUL 5 70	SUN	6	15.5	15.0	16.0	26.0	16.5	14.5	15.0	18.0	17.0	16.0	8.1	8.5	8.8	9.3	8.5
JUL 6 70	MON	6															
JUL 7 70	TUE	6															
JUL 8 70	WED	6															
JUL 9 70	THU	6	16.5	17.0	16.5	41.0	24.0	20.5	14.5	31.0	28.5	27.0	8.6	8.0	9.1	8.8	9.3
JUL 10 70	FRI																
JUL 11 70	SAT																
JUL 12 70	SUN	6	12.5	14.0	12.5	33.0	20.0	17.0	19.5	26.0	24.5	22.5	7.4	8.6	8.9	8.9	8.8
JUL 13 70	MON	6															
JUL 14 70	TUE	6															
JUL 15 70	WED																
JUL 16 70	THU																
JUL 17 70	FRI																

Date of Obsv	Day of Week	Samp Type	P-2 NH3	F-2 NH3	S-2 NH3	Inf KJLD N	P-1 KJLD N	F-1 KJLD N	S-1 KJLD N	P-2 KJLD N	F-2 KJLD N	S-2 KJLD N	Inf Totl IN P	P-1 Totl IN P	F-1 Totl IN P	S-1 Totl IN P	P-2 Totl IN P
JUL 18 70	SAT																
JUL 19 70	SUN	6															
JUL 20 70	MON	6															
JUL 21 70	MON																
JUL 22 70	TUE																
JUL 23 70	THU	6	16.0	15.0	14.5	42.0	32.0	28.5	26.0	23.0	23.5	19.5	8.0	8.8	8.4	8.8	8.8
JUL 24 70	THU																
JUL 25 70	FRI																
JUL 26 70	SUN	6	9.0	7.5	7.5	36.5	24.5	21.0	20.0	15.0	14.5	15.5	9.5	10.4	9.5	8.4	9.6
JUL 27 70	MON	6															
JUL 28 70	TUE	6	23.0	20.5	17.5	49.0	36.5	31.5	31.0	32.0	34.0	25.5	9.6	10.0	10.1	6.2	8.7
JUL 29 70	WED																
JUL 30 70	THU																
JUL 31 70	FRI																
AUG 1 70	SAT																
AUG 2 70	SUN																
AUG 3 70	MON																
AUG 4 70	TUE																
AUG 5 70	WED	6															
AUG 6 70	THU	6	16.0	13.5	14.0	31.5	26.5	23.5	24.5	22.0	18.0	18.0	8.4	9.0	9.5	9.1	9.1
AUG 7 70	FRI																
AUG 8 70	SAT																
AUG 9 70	SUN	6	14.5			32.5	26.5		24.5	21.5		18.5	7.4	8.9		9.3	9.2
AUG 10 70	MON	6															
AUG 11 70	TUE																
AUG 12 70	WED	6															
AUG 13 70	THU	6	15.5		14.0	21.5	19.5	17.5	19.0	22.5		18.5	6.1	7.0	6.9	7.7	8.4
AUG 14 70	FRI																
AUG 16 70	SUN	6	15.0		14.0	29.0	22.5	21.5	22.0	19.5		18.0	7.6	8.8	8.8	8.2	8.4
AUG 17 70	MON	6															
AUG 18 70	TUE	11	15.5	13.0	15.5	37.5	24.0	20.0	15.0	19.0	15.0	19.0	9.5	8.9	8.7	8.3	8.4
AUG 19 70	WED																
AUG 20 70	THU	6	17.0	14.5	15.5	32.5	24.0	22.0	21.0	22.0	17.5	18.0	9.3	9.0	9.3	9.7	9.3
AUG 21 70	FRI																
AUG 23 70	SUN																
AUG 24 70	MON	6															
AUG 25 70	TUE	6	12.5	0.1	9.5	33.0	21.0	17.0	16.5	17.0	14.0	13.0	8.6	9.8	8.7	9.3	9.4
AUG 26 70	WED	6															
AUG 27 70	THU	6	15.0	13.5	12.5	40.0	29.0	25.5	26.0	24.0	26.0	19.0	7.5	7.2	8.7	9.0	7.5
AUG 28 70	FRI																
AUG 29 70	SAT																
AUG 30 70	SUN	6		9.5	9.5	32.0	25.0	24.0	22.5		16.5	17.0	6.5	8.2	7.5	7.6	
AUG 31 70	MON	6															
SEP 1 70	TUE	6	14.0	12.5	11.5	28.5	18.5	17.5	15.0	18.5	14.0	14.0	10.2	11.0	9.9	9.6	9.6
SEP 2 70	WED	6															
SEP 3 70	THU	6	18.0	16.5	16.0	28.0	23.0	23.5	20.0	21.5	18.0	19.5	10.1	8.6	10.5	9.0	9.4
SEP 6 70	SUN																
SEP 7 70	MON	6															
SEP 8 70	TUE	6															
SEP 8 70	TUE	10	17.5	18.0	19.0	26.0	23.0	18.0	14.5	19.0	19.5	20.0	8.9	9.0	10.1	10.0	9.0
SEP 9 70	WED																
SEP 10 70	THU	6															
SEP 10 70	THU	10	17.5	18.0	19.0	26.0	23.0	18.0	14.5	19.0	19.5	20.0	8.9	9.0	10.1	10.0	9.0

Date of Obsv	Day of Week	Samp Type	P-2 NH3	F-2 NH3	S-2 NH3	Inf KJLD N	P-1 KJLD N	F-1 KJLD N	S-1 KJLD N	P-2 KJLD N	F-2 KJLD N	S-2 KJLD N	Inf Totl IN P	P-1 Totl IN P	F-1 Totl IN P	S-1 Totl IN P	P-2 Totl IN P
SEP 11 70	FRI																
SEP 12 70	SAT																
SEP 13 70	SUN	6															
SEP 13 70	SUN	12	20.5	19.0	18.0	27.5	22.5	19.0	19.0	24.0	20.0	19.0	9.0	9.5	10.0	9.9	10.2
SEP 14 70	MON	6															
SEP 15 70	TUE	6															
SEP 15 70	TUE	12	20.5	19.0		27.5	22.5	19.0	19.0	24.0	20.0		9.0	9.5	10.0	9.9	10.2
SEP 16 70	WED	6															
SEP 17 70	THU	12	20.5	19.0	18.0	27.5	22.5	19.0	19.0	24.0	20.0	19.0	9.0	9.5	10.0	9.9	10.2
SEP 17 70	THU	6															
SEP 18 70	FRI																
SEP 19 70	SAT																
SEP 20 70	SUN	6															
SEP 20 70	SUN	12	22.5	22.5	23.0	29.5	26.0	25.0	22.5	27.0	25.0	25.0	9.4	9.8	10.2	9.9	10.3
SEP 21 70	MON	6															
SEP 22 70	TUE	6															
SEP 22 70	TUE	12	22.5	22.5	23.0	29.5	26.0	25.0	22.5	27.0	25.0	25.0	9.4	9.8	10.2	9.9	10.3
SEP 23 70	WED	6															
SEP 24 70	THU	12	22.5	22.5	23.0	29.5	26.0	25.0	22.5	27.0	25.0	25.0	9.4	9.8	10.2	9.9	10.3
SEP 24 70	THU	6															
SEP 25 70	FRI																
SEP 26 70	SAT																
SEP 27 70	SUN	6															
SEP 27 70	SUN	12	21.5	21.0	21.0	36.0	31.0	21.0	20.0	24.5	21.5	29.5	8.4	8.5	10.0	9.6	8.3
SEP 28 70	MON	6															
SEP 29 70	TUE	6															
SEP 29 70	TUE	12	21.5	21.0	21.0	36.0	31.0	21.0	20.0	24.5	21.5	29.5	8.4	8.5	10.0	9.6	8.3
SEP 30 70	WED	6															
OCT 1 70	THU	12	21.5	21.0	21.0	36.0	31.0	21.0	20.0	24.5	21.5	29.5	8.4	8.5	10.0	9.6	8.3
OCT 1 70	THU	6															
OCT 2 70	FRI																
OCT 3 70	SAT																
OCT 4 70	SUN	4	24.5	23.5	23.0	31.0	21.5	21.5	20.5	24.5	23.5	23.0	6.0	8.6	9.1	11.4	10.8
OCT 4 70	SUN	13															
OCT 5 70	MON	6															
OCT 6 70	TUE	6															
OCT 6 70	TUE	4	24.5	23.5	23.0	31.0	21.5	21.5	20.5	24.5	23.5	23.0	6.0	8.6	9.1	11.4	10.8
OCT 8 70	THU																
OCT 7 70	WED																
OCT 9 70	FRI																
OCT 10 70	SAT																
OCT 11 70	SUN																
OCT 12 70	MON																
OCT 13 70	TUE																
OCT 14 70	WED																
OCT 15 70	THU																
OCT 16 70	FRI																
OCT 17 70	SAT																
OCT 18 70	SUN	6															
OCT 18 70	SUN	12	25.0	26.0	25.0	32.0	23.0	24.0	22.0	27.5	30.5	26.5	8.5	8.9	9.1	9.0	9.1
OCT 19 70	MON	6															
OCT 20 70	TUE	12	25.0	26.0	25.0	32.0	23.0	24.0	22.0	27.5	30.5	26.5	8.5	8.9	9.1	9.0	9.1
OCT 20 70	TUE	6															

Date of Obsv	Day of Week	Samp Type	P-2 NH3	F-2 NH3	S-2 NH3	Inf KJLD N	P-1 KJLD N	F-1 KJLD N	S-1 KJLD N	P-2 KJLD N	F-2 KJLD N	S-2 KJLD N	Inf Totl IN P	P-1 Totl IN P	F-1 Totl IN P	S-1 Totl IN P	P-2 Totl IN P
OCT 21 70	WED	6															
OCT 22 70	THU	6															
OCT 22 70	THU	12	25.0	26.0	25.0	32.0	23.0	24.0	22.0	27.5	30.5	26.5	8.5	8.9	9.1	9.0	9.1
OCT 23 70	FRI																
OCT 24 70	SAT																
OCT 25 70	SUN	13															
OCT 25 70	SUN	12	29.0	28.5	28.5	42.5	39.5	35.0	35.0	44.0	49.5	41.5	8.5	9.3	10.1	9.3	8.9
OCT 26 70	MON	6															
OCT 27 70	TUE	6															
OCT 27 70	TUE	12	29.0	28.5	28.5	42.5	39.5	35.0	35.0	44.0	49.5	41.5	8.5	9.3	10.1	9.3	8.9
OCT 28 70	WED	6															
OCT 29 70	THU	6															
OCT 29 70	THU	12	29.0	28.5	28.5	42.5	39.5	35.0	35.0	44.0	49.5	41.5	8.5	9.3	10.1	9.3	8.9
OCT 30 70	FRI																
OCT 31 70	SAT																
NOV 1 70	SUN	6															
NOV 1 70	SUN	10	19.5	21.0	21.5	42.0	26.5	25.0	19.5	27.5	27.0	27.5	6.1	7.4	8.4	6.0	5.8
NOV 2 70	MON	6															
NOV 3 70	TUE																
NOV 4 70	WED																
NOV 5 70	THU	6															
NOV 5 70	THU	10	19.5	21.0	21.5	42.0	26.5	25.0	19.5	27.5	27.0	27.5	6.1	7.4	8.4	6.0	5.8
NOV 6 70	FRI																
NOV 7 70	SAT																
NOV 8 70	SUN	6															
NOV 8 70	SUN	10	24.0	24.5	25.5	29.0	23.0	21.5	21.0	28.0	26.0	27.0	6.9	7.7	8.3	8.5	7.5
NOV 9 70	MON	6															
NOV 10 70	TUE	6															
NOV 10 70	TUE	10	24.0	24.5	25.5	29.0	23.0	21.5	21.0	28.0	26.0	27.0	6.9	7.7	8.3	8.5	7.5
NOV 11 70	WED	6															
NOV 12 70	THU																
NOV 13 70	FRI																
NOV 14 70	SAT																
NOV 15 70	SUN																
NOV 16 70	MON																
NOV 17 70	TUE																
NOV 18 70	WED																
NOV 19 70	THU																
NOV 20 70	FRI																
NOV 21 70	SAT																
NOV 22 70	SUN																
NOV 23 70	MON																
NOV 24 70	TUE	6	27.5	28.0	27.0	29.0	21.0	19.5	19.5	27.5	29.5	27.0	8.0	8.1	8.2	8.4	8.4
NOV 25 70	THU																
NOV 26 70	THU																
NOV 27 70	FRI																
NOV 28 70	SAT																
NOV 29 70	SUN	6															
NOV 30 70	MON	6															
DEC 1 70	TUE	6															
DEC 1 70	TUE	12	25.5	28.5	28.5	31.0	21.0	20.5	19.5	26.0	28.5	50.0	7.4	8.6	8.7	8.8	8.7
DEC 2 70	WED	6															
DEC 3 70	THU	6															

Date of Obsv	Day of Week	Samp Type	P-2 NH3	P-2 NH3	S-2 NH3	Inf KJLD N	P-1 KJLD N	P-1 KJLD N	S-1 KJLD N	P-2 KJLD N	P-2 KJLD N	S-2 KJLD N	Inf Totl IN P	P-1 Totl IN P	P-1 Totl IN P	S-1 Totl IN P	P-2 Totl IN P
DEC 3 70	THU	12	25.5	28.5	28.5	31.0	21.0	20.5	19.5	26.0	28.5	50.0	7.4	8.6	8.7	8.8	8.7
DEC 4 70	FRI	99															
DEC 5 70	SAT	99															
DEC 6 70	SUN	6															
DEC 6 70	SUN	12	23.5	26.5	25.5	39.0	23.5	21.0	17.5	32.0	38.0	32.0	9.0	9.4	9.7	10.1	9.8
DEC 7 70	MON	99															
DEC 8 70	TUE	6															
DEC 8 70	TUE	12	23.5	26.5	25.5	39.0	23.5	21.0	17.5	32.0	38.0	32.0	9.0	9.4	9.7	10.1	9.8
DEC 9 70	WED	6															
DEC 10 70	THU	6															
DEC 10 70	THU	12	23.5	26.5	25.5	39.0	23.5	21.0		32.0	38.0	32.0	9.0	9.4	9.7		9.8
DEC 11 70	FRI	99															
DEC 12 70	SAT	99															
DEC 13 70	SUN	6	24.0	25.5	23.0	38.0	22.0	17.5	20.5	37.5	43.5	40.0	7.3	9.1	9.6	10.3	8.0
DEC 14 70	MON	6															
DEC 15 70	TUE	6	25.0	26.0	25.5	43.0	23.5	19.5	18.5	40.0	37.0	35.5	7.9	8.3	8.9	9.0	8.7
DEC 16 70	WED	11															
DEC 17 70	THU	6	20.0	22.0	20.0	32.5	19.5	17.5	18.0	31.5	31.5	30.0	6.5	6.4	6.9	7.0	6.9
DEC 20 70	SUN	6	20.5	23.0	22.0	33.0	15.5	13.0	13.0	30.5	31.0	31.0	6.7	7.4	7.5	8.5	7.8
DEC 21 70	MON	6															
DEC 22 70	TUE	99															
DEC 23 70	WED	99															
DEC 24 70	THU	99															
DEC 25 70	FRI	99															
DEC 26 70	SAT	99															
DEC 27 70	SUN	6	19.0	20.0	20.5	27.0	13.5	9.5	9.0	25.5	26.5	29.0	5.1	6.8	6.9	6.5	5.4
DEC 28 70	MON	6															
DEC 29 70	TUE	6	22.5	23.5	23.0	41.0	18.0	14.0	12.5	30.0	30.0	29.5	6.8	6.3	6.0	5.9	6.5
DEC 30 70	WED	6															
DEC 31 70	THU	99															
JAN 1 71	FRI	99															
JAN 2 71	SAT	99															
JAN 3 71	SUN	6	22.0	22.0	22.5	24.5	14.0	14.0	12.0	27.5	22.0	25.5	6.7	7.5	7.5	7.3	7.2
JAN 4 71	MON	6															
JAN 5 71	TUE	6	17.0	13.5	17.5	23.5	14.5	19.0	13.0	20.0	13.5	18.0	3.9	5.9	5.0	6.4	4.5
JAN 6 71	WED	6															
JAN 7 71	THU	6	25.0	25.5	25.0	29.5	19.0	17.0	16.0	26.5	29.0	28.0	5.5	6.5	7.0	6.9	7.4
JAN 8 71	FRI	99															
JAN 9 71	SAT	99															
JAN 10 71	SUN	6	22.5	23.0	23.5	20.5	19.0	16.0	15.0	24.5	23.0	26.5	5.2	7.0	6.9	6.8	6.3
JAN 11 71	MON	6															
JAN 12 71	TUE	6		20.0	20.0	28.0	25.5	22.0	22.0		23.5	24.0	6.1	7.0	7.2	7.4	
JAN 13 71	WED	6															
JAN 14 71	THU	6	22.5	23.0	23.0	31.5	26.0	22.5	24.0	26.5	28.0	31.0	7.2	8.1	8.2	8.1	8.3
JAN 15 71	FRI	99															
JAN 16 71	SAT	99															
JAN 17 71	SUN	6	21.0	21.5	21.5	29.0	21.0	18.5	19.5	27.0	26.0	26.5	6.4	7.8	8.1	8.4	7.2
JAN 18 71	MON	6															
JAN 19 71	TUE	6	23.5	23.0	25.0	31.5	28.0	26.5	26.0	33.5	29.5	31.0	7.2	7.7	8.4	8.1	8.3
JAN 20 71	WED	6															
JAN 21 71	THU	6	23.0	22.5	22.5	34.5	31.0	26.5	27.0	31.5	32.5	31.0	7.7	8.9	8.8	8.7	8.2
JAN 22 71	FRI	99															
JAN 23 71	SAT	99															

Date of Obsv	Day of Week	Samp Type	P-2 NH3	F-2 NH3	S-2 NH3	Inf KJLD-N	P-1 KJLD N	F-1 KJLD N	S-1 KJLD N	P-2 KJLD N	F-2 KJLD N	S-2 KJLD N	Inf Totl IN P	P-1 Totl IN P	F-1 Totl IN P	S-1 Totl IN P	P-2 Totl IN P
JAN 24 71	SUN	6	20.5	20.5	21.0	32.5	26.5	25.5	23.0	29.5	26.5	27.0	7.1	7.9	8.4	8.4	6.9
JAN 25 71	MON	6															
JAN 26 71	TUE	6	20.5	21.5	21.0	30.0	26.0	23.5	25.0	27.5	28.5	26.0	6.9	7.6	7.9	7.8	7.7
JAN 27 71	WED	6															
JAN 28 71	THU	6	21.0	26.5	27.0	30.5	26.0	23.5	23.5	29.0	27.0	28.0	7.1	7.9	8.3	8.4	8.2
JAN 29 71	FRI	99															
JAN 30 71	SAT	99															
JAN 31 71	SUN	99															
FEB 1 71	MON	6															
FEB 2 71	TUE	6	27.0	28.5	29.0	32.5	29.5	28.0	28.0	35.0	32.5	32.5	8.2	8.2	8.5	8.4	7.9
FEB 3 71	WED	6															
FEB 4 71	THU	6	22.5	23.5	23.5	27.0	30.0	29.5	26.5	25.5	29.5	26.0	5.4	6.8	7.7	6.8	6.3
FEB 5 71	FRI	99															
FEB 6 71	SAT	99															
FEB 7 71	SUN	6	18.0	19.0	19.0	18.5	21.0	18.5	19.0	24.0	24.5	21.5	3.4	5.3	5.1	5.3	4.5
FEB 8 71	MON	6															
FEB 9 71	TUE	6	18.0	18.5	18.0	21.5	21.5	21.0	21.5	24.0	22.5	22.0	4.0	5.2	4.7	5.4	5.1
FEB 10 71	WED	6															
FEB 11 71	THU	6	18.5	20.0	20.0	26.5	26.5	27.5	28.5	26.5	29.0	26.0	5.3	6.6	7.1	7.1	6.9
FEB 12 71	FRI	99															
FEB 13 71	SAT	99															
FEB 14 71	SUN	6	17.0	17.5	18.0	30.0	26.0	23.0	22.0	26.5	25.0	23.5	4.8	4.9	5.1	5.2	5.1
FEB 15 71	MON	6															
FEB 16 71	TUE	6	19.5	19.5	19.5	31.0	29.0	30.5	30.0	31.0	27.5	27.0	5.7	6.5	7.1	7.2	7.2
FEB 17 71	WED	6															
FEB 18 71	THU	6	21.0	22.0	22.0	26.5	25.5	26.5	26.0	27.0	28.0	27.0	7.1	7.7	7.7	7.8	7.6
FEB 19 71	FRI	99															
FEB 20 71	SAT	99															
FEB 21 71	SUN	6	24.0	24.5	24.5	33.5	33.5	33.5	32.5	34.5	32.0	33.0	6.8	8.3	8.0	8.3	8.1
FEB 22 71	MON	6															
FEB 23 71	TUE	6	22.5	22.5	21.5	31.5	31.5	31.5	31.5	31.0	31.5	28.0	6.4	6.7	7.6	7.0	6.9
FEB 24 71	WED	6															
FEB 25 71	THU	6	20.5	22.0	21.5	33.5	30.5	31.0	32.5	26.5	26.0	26.0	7.2	7.6	7.9	7.9	8.0
FEB 26 71	FRI	99															
FEB 27 71	SAT	99															
FEB 28 71	SUN	6	19.5	19.0	19.0	26.0	26.5	25.0	25.0	26.5	25.5	24.0	7.1	8.4	8.7	8.6	8.9
MAR 1 71	MON	6															
MAR 2 71	TUE	6	18.5	19.0	19.0	27.5	25.5	26.5	27.0	28.0	27.0	24.5	8.2	7.5	7.6	7.8	7.8
MAR 3 71	WED	6															
MAR 4 71	THU	6	15.5	15.5	14.5	22.5	21.0	21.5	20.5	21.0	20.0	21.0	5.3	5.4	5.4	5.3	5.8
MAR 5 71	FRI	99															
MAR 6 71	SAT	99															
MAR 7 71	SUN	6	18.5	18.4	18.8	26.0	26.5	26.0	26.0	26.0	25.5	24.0	3.9	4.8	5.2	5.2	4.9
MAR 8 71	MON	6															
MAR 9 71	TUE	6	22.0	22.4	22.2	33.5	29.5	28.0	30.0	29.5	29.5	27.5	4.3	5.2	5.2	4.9	4.8
MAR 10 71	WED	6															
MAR 11 71	THU	6															
MAR 12 71	FRI	99															
MAR 13 71	SAT	99															
MAR 14 71	SUN	6															
MAR 15 71	MON	6															
MAR 16 71	TUE	6															
MAR 17 71	WED	6															

Date of Obsv	Day of Week	Samp Type	P-2 NH3	F-2 NH3	S-2 NH3	Inf KJLD N	P-1 KJLD N	F-1 KJLD N	S-1 KJLD N	P-2 KJLD N	F-2 KJLD N	S-2 KJLD N	Inf Totl IN P	P-1 Totl IN P	F-1 Totl IN P	S-1 Totl IN P	P-2 Totl IN P
MAR 18 71	THU	6															
MAR 19 71	FRI	99															
MAR 20 71	SAT	99															
MAR 21 71	SUN	6															
MAR 22 71	MON	6															
MAR 23 71	TUE	6	24.8	24.6	24.0	34.5	34.0	32.5	33.0	32.5	34.5	31.5	7.5	9.9	9.6	8.8	9.2
MAR 24 71	WED	6															
MAR 25 71	THU	6															
MAR 26 71	FRI	99															
MAR 27 71	SAT	99															
MAR 28 71	SUN	6															
MAR 29 71	MON	6															
MAR 30 71	TUE	6															
MAR 31 71	WED	6															
APR 1 71	THU	6															
APR 2 71	FRI	99															
APR 3 71	SAT	99															
APR 4 71	SUN	6															
APR 5 71	MON	6															
APR 6 71	TUE	6	19.5	19.0	20.5	26.0	25.5	24.5	24.0	26.0	24.5	23.5	6.0	6.6	6.4	6.2	6.6
APR 7 71	WED	6															
APR 8 71	THU	6															
APR 9 71	FRI	99															
APR 10 71	SAT	99															
APR 11 71	SUN	99															
APR 12 71	MON	6															
APR 13 71	TUE	6															
APR 14 71	WED	6															
APR 15 71	THU	6															
APR 16 71	FRI	99															
APR 17 71	SAT	99															
APR 18 71	SUN	6															
APR 19 71	MON	6															
APR 20 71	TUE	6															
APR 21 71	WED	6															
APR 22 71	THU	6	29.0	31.0	30.0	36.5	32.5	31.5	31.5	34.5	35.0	33.0	7.7	8.3	8.2	7.8	8.2
APR 23 71	FRI	99															
APR 24 71	SAT	99															
APR 25 71	SUN	6															
APR 26 71	MON	6															
APR 27 71	TUE	6															
APR 28 71	WED	6															
APR 29 71	THU	6															
APR 30 71	FRI	99															
MAY 1 71	SAT	99															
MAY 2 71	SUN	6															
MAY 3 71	MON	6															
MAY 4 71	TUE	6	27.5	26.5	27.5	30.0	28.0	28.5	29.5	28.0	27.5	28.5	5.8	7.5	7.6	7.5	7.0
MAY 5 71	WED	99															
MAY 6 71	THU	6															
MAY 7 71	FRI	99															
MAY 8 71	SAT	99															
MAY 9 71	SUN	6															

Date of Obsv	Day of Week	Samp Type	P-2 NH3	P-2 NH3	S-2 NH3	Inf KJLD N	P-1 KJLD N	P-1 KJLD N	S-1 KJLD N	P-2 KJLD N	P-2 KJLD N	S-2 KJLD N	Inf Totl IN P	P-1 Totl IN P	P-1 Totl IN P	S-1 Totl IN P	P-2 Totl IN P
MAY 10 71	MON	99															
MAY 11 71	TUE	99															
MAY 12 71	WED	99															
MAY 13 71	THU	99															
MAY 14 71	FRI	99															
MAY 15 71	SAT	99															
MAY 16 71	SUN	6															
MAY 17 71	MON	6															
MAY 18 71	TUE	6															
MAY 19 71	WED	99															
MAY 20 71	THU	6															
MAY 21 71	FRI	99															
MAY 22 71	SAT	99															
MAY 23 71	SUN	6															
MAY 24 71	MON	6															
MAY 25 71	TUE	6															
MAY 26 71	WED	6															
MAY 27 71	THU	6															
MAY 28 71	FRI	99															
MAY 29 71	SAT	99															
MAY 30 71	SUN	99															
MAY 31 71	MON	6															
JUN 1 71	TUE	6															
JUN 2 71	WED	6															
JUN 3 71	THU	6															
JUN 4 71	FRI	99															
JUN 5 71	SAT	99															
JUN 6 71	SUN	6															
JUN 7 71	MON	6															
JUN 8 71	TUE	6															
JUN 9 71	WED	6															
JUN 10 71	THU	6															
JUN 11 71	FRI	99															
JUN 12 71	SAT	99															
JUN 13 71	SUN	6															
JUN 14 71	MON	6															
JUN 15 71	TUE	6															
JUN 16 71	WED	6															
JUN 17 71	THU	99															
JUN 18 71	FRI	99															
JUN 19 71	SAT	99															
JUN 20 71	SUN	99															
JUN 21 71	MON	99															
JUN 22 71	TUE	6															
JUN 23 71	WED	99															
JUN 24 71	THU	6															
JUN 25 71	FRI	99															
JUN 26 71	SAT	6															
JUN 27 71	SUN	99															
JUN 28 71	MON	6															
JUN 29 71	TUE	6															
JUN 30 71	WED	6															
[illegible] 71	THU	6															

Date of Obsv	Day of Week	Samp Type	P-2 NH3	F-2 NH3	S-2 NH3	Inf KJLD N	P-1 KJLD N	F-1 KJLD N	S-1 KJLD N	P-2 KJLD N	F-2 KJLD N	S-2 KJLD N	Inf Totl IN P	P-1 Totl IN P	F-1 Totl IN P	S-1 Totl IN P	P-2 Totl IN P
JUL 2 71	FRI	99															
JUL 3 71	SAT	99															
JUL 4 71	SUN	99															
JUL 5 71	MON	6															
JUL 6 71	TUE	6															
JUL 7 71	WED	6															
JUL 8 71	THU	6	12.5	12.5	11.0	29.0	24.5	17.0	20.0	22.0	20.5	14.0	7.7	7.6	7.1	8.0	8.0
JUL 9 71	FRI	99															
JUL 10 71	SAT	6															
JUL 11 71	SUN	99															
JUL 12 71	MON	6															
JUL 13 71	TUE	6															
JUL 14 71	WED	6															
JUL 15 71	THU	6	13.0	12.0	11.5	26.5	24.5	21.0	19.0	17.5	16.0	14.5	8.0	8.9	8.8	8.6	8.7
JUL 16 71	FRI	99															
JUL 17 71	SAT	6															
JUL 18 71	SUN	99															
JUL 19 71	MON	6															
JUL 20 71	TUE	6															
JUL 21 71	WED	6															
JUL 22 71	THU	6	16.5	14.5	13.5	35.0	28.0	20.5	20.0	19.5	16.0	16.5	8.7	8.8	8.9	8.7	8.8
JUL 23 71	FRI	99					28.0	20.5	20.0	19.5	16.0	16.5					
JUL 24 71	SAT	6															
JUL 25 71	SUN	99															
JUL 26 71	MON	6															
JUL 27 71	TUE	6															
JUL 28 71	WED	6															
JUL 29 71	THU	6															
JUL 30 71	FRI	99															
JUL 31 71	SAT	99															
AUG 1 71	SUN	99															
AUG 2 71	MON	6															
AUG 3 71	TUE	6															
AUG 4 71	WED	6															
AUG 5 71	THU	6	15.0	12.5	12.5	26.5	21.5	19.0	19.0	15.5	13.0	14.0	7.1	7.0	7.0	7.1	7.3
AUG 6 71	FRI	99															
AUG 7 71	SAT	99															
AUG 8 71	SUN	99															
AUG 9 71	MON	6															
AUG 10 71	TUE	6															
AUG 11 71	WED	6															
AUG 12 71	THU	6	11.5	10.5	10.5	28.0	27.5	22.0	27.5	25.0	16.0	19.5	7.7	9.0	8.6	8.2	8.1
AUG 13 71	FRI	99															
AUG 14 71	SAT	6															
AUG 15 71	SUN	99															
AUG 16 71	MON	6															
AUG 17 71	TUE	6	16.0		13.0	24.0	22.5	19.0	18.5	16.0		13.5	5.7	7.0	7.5	8.0	7.7
AUG 18 71	WED	6															
AUG 19 71	THU	6	14.0	14.5	12.0	30.0	24.0	12.0	16.5	15.0	16.0	12.5	7.3	8.3	7.0	8.0	7.3
AUG 20 71	FRI	99															
AUG 21 71	SAT	6															
AUG 22 71	SUN	99															
AUG 23 71	MON	6															

Date of Obsv	Day of Week	Samp Type	P-2 NH3	F-2 NH3	S-2 NH3	Inf KJLD N	P-1 KJLD N	F-1 KJLD N	S-1 KJLD N	P-2 KJLD N	F-2 KJLD N	S-2 KJLD N	Inf Totl IN P	P-1 Totl IN P	F-1 Totl IN P	S-1 Totl IN P	P-2 Totl IN P
AUG 24 71	TUE	6	9.0	8.5	7.5	21.5	20.0	13.5	14.0	11.5	12.5	11.5	7.3	7.5	7.4	7.9	7.5
AUG 25 71	WED	6															
AUG 26 71	THU	6	13.0	12.5	12.0	24.5	24.0	17.0	17.0	16.0	18.0	14.0	6.4	7.2	7.1	7.6	7.6
AUG 27 71	FRI	99															
AUG 28 71	SAT	6															
AUG 29 71	SUN	99															
AUG 30 71	MON	6															
AUG 31 71	TUE	6	20.0	18.5	18.0	25.0	25.0	20.0	19.0	19.0	18.0	17.0	7.4	7.8	7.7	7.7	8.0
SEP 1 71	WED	6															
SEP 2 71	THU	6	25.0	22.5	25.0	28.5	27.0	22.5	22.5	22.5	20.0	22.0	6.8	7.4	7.0	7.3	7.5
SEP 3 71	FRI	99															
SEP 4 71	SAT	99															
SEP 5 71	SUN	99															
SEP 6 71	MON	99															
SEP 7 71	TUE	6	27.5	24.5	26.5	29.5	26.5	25.5	24.5	32.0	25.5	28.5	7.5	8.0	8.4	8.4	8.7
SEP 8 71	WED	6															
SEP 9 71	THU	6	32.5		27.5	35.5	29.0	28.0	29.5	41.5		29.5	7.4	7.8	8.7	8.7	8.4
SEP 10 71	FRI	99															
SEP 11 71	SAT	6															
SEP 12 71	SUN	99															
SEP 13 71	MON	6															
SEP 14 71	TUE	99															
SEP 15 71	WED	6															
SEP 16 71	THU	6	21.5	18.5	17.0	26.5	25.5	21.5	19.5	29.5	24.5	25.0	6.2	7.6	7.2	7.2	7.7
SEP 17 71	FRI	99															
SEP 18 71	SAT	6															
SEP 19 71	SUN	99															
SEP 20 71	MON	6															
SEP 21 71	TUE	6	17.0	18.0	15.5	20.5	19.5	19.5	17.5	21.5	21.0	18.0	5.7	5.8	6.6	6.2	6.0
SEP 22 71	WED	6															
SEP 23 71	THU	6	22.5		21.5	28.0	23.0	22.5	21.5	25.5		23.5	6.8	7.1	7.2	7.2	7.2
SEP 24 71	FRI	99															
SEP 25 71	SAT	6															
SEP 26 71	SUN	99															
SEP 27 71	MON	6															
SEP 28 71	TUE	99															
SEP 29 71	WED	99															
SEP 30 71	THU	6															
OCT 1 71	FRI	99															
OCT 2 71	SAT	6															
OCT 3 71	SUN	99															
OCT 4 71	MON	6															
OCT 5 71	TUE	6															
OCT 6 71	WED	6															
OCT 7 71	THU	99															
OCT 8 71	FRI	99															
OCT 9 71	SAT	99															
OCT 10 71	SUN	6															
OCT 11 71	MON	6															
OCT 12 71	TUE	6															
OCT 13 71	WED	6															
OCT 14 71	THU	6															
OCT 15 71	FRI	99															

Date of Obsv	Day of Week	Samp Type	P-2 NH3	F-2 NH3	S-2 NH3	Inf KJLD N	P-1 KJLD N	F-1 KJLD N	S-1 KJLD N	P-2 KJLD N	F-2 KJLD N	S-2 KJLD N	Inf Totl IN P	P-1 Totl IN P	F-1 Totl IN P	S-1 Totl IN P	P-2 Totl IN P
			--.-	--.-	--.-	--.-	--.-	--.-	--.-	--.-	--.-	--.-	--.-	--.-	--.-	--.-	--.-
OCT 16 71	SAT	6															
OCT 17 71	SUN	99															
OCT 18 71	MON	6															
OCT 19 71	TUE	6															
OCT 20 71	WED	6															
OCT 21 71	THU	6															
OCT 22 71	FRI	99															
OCT 23 71	SAT	6															
OCT 24 71	SUN	99															
OCT 25 71	MON	99															
OCT 26 71	TUE	99															
OCT 27 71	WED	99															
OCT 28 71	THU	99															
OCT 29 71	FRI	99															
OCT 30 71	SAT	99															
OCT 31 71	SUN	99															
NOV 1 71	MON	6															
NOV 2 71	TUE	6															
NOV 3 71	WED	6															
NOV 4 71	THU	99															
NOV 5 71	FRI	99															
NOV 6 71	SAT	99															
NOV 7 71	SUN	99															
NOV 8 71	MON	99															
NOV 9 71	TUE	99															
NOV 10 71	WED	6															
NOV 11 71	THU	6															
NOV 12 71	FRI	99															
NOV 13 71	SAT	6															
NOV 14 71	SUN	99															
NOV 15 71	MON	6															
NOV 16 71	TUE	6															
NOV 17 71	WED	6															
NOV 18 71	THU	6															
NOV 19 71	FRI	99															
NOV 20 71	SAT	6															
NOV 21 71	SUN	99															
NOV 22 71	MON	6															
NOV 23 71	TUE	6															
NOV 24 71	WED	99															
NOV 25 71	THU	99															
NOV 26 71	FRI	99															
NOV 27 71	SAT	6															
NOV 28 71	SUN	99															
NOV 29 71	MON	6															
NOV 30 71	TUE	15															
DEC 1 71	WED	15															
DEC 2 71	THU	15															
DEC 3 71	FRI	99															
DEC 4 71	SAT	15															
DEC 5 71	SUN	99															
DEC 6 71	MON	15															
DEC 7 71	TUE	15															

Date of Obsv	Day of Week	Samp Type	P-2 NH3	F-2 NH3	S-2 NH3	Inf KJLD N	P-1 KJLD N	F-1 KJLD N	S-1 KJLD N	P-2 KJLD N	F-2 KJLD N	S-2 KJLD N	Inf Totl IN P	P-1 Totl IN P	F-1 Totl IN P	S-1 Totl IN P	P-2 Totl IN P
DEC 8 71	WED	15															
DEC 9 71	THU	15															
DEC 10 71	FRI	99															
DEC 11 71	SAT	15															
DEC 12 71	SUN	99															
DEC 13 71	MON	15															
DEC 14 71	TUE	15															
DEC 15 71	WED	15															
DEC 17 71	FRI	99															
DEC 18 71	SAT	15															
DEC 19 71	SUN	99															
DEC 20 71	MON	15															
DEC 21 71	TUE	99															
DEC 22 71	WED	99															
DEC 23 71	THU	99															
DEC 24 71	FRI	99															
DEC 25 71	SAT	99															
DEC 26 71	SUN	99															
DEC 27 71	MON	99															
DEC 28 71	TUE	15															
DEC 29 71	WED	15															
DEC 30 71	THU	15															
DEC 31 71	FRI	99															
JAN 1 72	SAT	99															
JAN 2 72	SUN	99															
JAN 3 72	MON	15															
JAN 4 72	TUE	15															
JAN 5 72	WED	15															
JAN 6 72	THU	15															
JAN 7 72	FRI	99															
JAN 8 72	SAT	15															
JAN 9 72	SUN	99															
JAN 10 72	MON	15															
JAN 11 72	TUE	15	19.0	19.5	19.5	23.5	22.0		20.0	21.0	22.0	22.0	6.4	5.7		5.8	5.7
JAN 12 72	WED	15															
JAN 13 72	THU	99															
JAN 14 72	FRI	99															
JAN 15 72	SAT	15															
JAN 16 72	SUN	99															
JAN 17 72	MON	15															
JAN 18 72	TUE	15	24.5	25.0	25.5	35.0	31.5	29.0	27.0	31.5	32.0	32.0	8.4	7.8	7.8	7.5	8.0
JAN 19 72	WED	15															
JAN 20 72	THU	15	26.0	25.0	25.0	37.5	31.5	31.5	30.0	36.0	35.5	32.5	8.8	7.8	7.9	7.5	8.7
JAN 21 72	FRI	99															
JAN 22 72	SAT	15															
JAN 23 72	SUN	99															
JAN 24 72	MON	15															

Date of Obsv	Day of Week	Samp Type	F-2 Totl IN P	S-2 Totl IN P	Inf Totl P	P-1 Totl P	F-1 Totl P	S-1 Totl P	P-2 Totl P	F-2 Totl P	S-2 Totl P	Inf Turb	P-1 Turb	F-1 Turb	S-1 Turb	P-2 Turb	F-2 Turb	S-2 Turb
NOV 19 69	WED	6																
NOV 19 69	WED	4																
NOV 20 69	THU	6																
NOV 20 69	THU	4																
NOV 21 69	FRI	6																
NOV 21 69	FRI	7																
NOV 22 69	SAT	4																
NOV 22 69	SAT	7																
NOV 23 69	SUN	4																
NOV 23 69	SUN	7																
NOV 24 69	MON	6																
NOV 24 69	MON	4																
NOV 25 69	TUE	6																
NOV 25 69	TUE	4																
NOV 26 69	WED																	
NOV 27 69	THU																	
NOV 28 69	FRI																	
NOV 29 69	SAT	4																
NOV 30 69	SUN	4																
DEC 1 69	MON	6																
DEC 1 69	MON	4																
DEC 2 69	TUE	6																
DEC 2 69	TUE	4																
DEC 3 69	WED	6																
DEC 3 69	WED	4																
DEC 4 69	THU	6																
DEC 4 69	THU	4																
DEC 5 69	FRI	6																
DEC 5 69	FRI	7																
DEC 6 69	SAT	4																
DEC 6 69	SAT	7																
DEC 7 69	SUN	4																
DEC 7 69	SUN	7																
DEC 8 69	MON	6																
DEC 8 69	MON	4																
DEC 9 69	TUE	6																
DEC 9 69	TUE	4																
DEC 10 69	WED	6																
DEC 10 69	WED	4																
DEC 11 69	THU	6																
DEC 11 69	THU	4																
DEC 12 69	FRI	7																
DEC 12 69	FRI	6																
DEC 13 69	SAT	7																
DEC 13 69	SAT	4																
DEC 14 69	SUN	7																
DEC 14 69	SUN	4																
DEC 15 69	MON	4																
DEC 15 69	MON	6																
DEC 16 69	TUE	6																
DEC 16 69	TUE	4																
DEC 17 69	WED	6																
DEC 17 69	WED	4																

Date of Obsv	Day of Week	Samp Type	F-2 Totl IN P	S-2 Totl IN P	Inf Totl P	P-1 Totl P	F-1 Totl P	S-1 Totl P	P-2 Totl P	F-2 Totl P	S-2 Totl P	Inf Turb	P-1 Turb	F-1 Turb	S-1 Turb	P-2 Turb	F-2 Turb	S-2 Turb
DEC 18 69	THU	6																
DEC 18 69	THU	4																
DEC 19 69	FRI																	
DEC 20 69	SAT																	
DEC 21 69	SUN																	
DEC 22 69	MON																	
DEC 23 69	TUE																	
DEC 24 69	WED																	
DEC 25 69	THU																	
DEC 26 69	FRI																	
DEC 27 69	SAT																	
DEC 28 69	SUN																	
DEC 29 69	MON	6																
DEC 29 69	MON	4																
DEC 30 69	TUE	6																
DEC 30 69	TUE	4																
JAN 1 70	THU																	
JAN 2 70	FRI																	
JAN 5 70	MON																	
JAN 6 70	TUE																	
JAN 7 70	WED																	
JAN 8 70	THU																	
JAN 9 70	FRI																	
JAN 10 70	SAT																	
JAN 11 70	SUN																	
JAN 12 70	MON																	
JAN 13 70	TUE																	
JAN 14 70	WED																	
JAN 15 70	THU																	
JAN 16 70	FRI																	
JAN 17 70	SAT	4																
JAN 18 70	SUN	4																
JAN 19 70	MON	4	9.0	9.5														
JAN 20 70	TUE	4	9.0	9.5														
JAN 21 70	WED	4	8.6	8.2														
JAN 22 70	THU	4	8.6	8.2														
JAN 23 70	FRI	7	9.4	10.2														
JAN 24 70	SAT	7	9.4	10.2														
JAN 25 70	SUN	7	9.4	10.2														
JAN 26 70	MON	4	11.9	10.2														
JAN 27 70	TUE	4	11.9	10.2														
JAN 28 70	WED	4	10.3	9.6														
JAN 29 70	THU	4	10.3	9.6														
JAN 30 70	FRI	7	8.7	8.8														
JAN 31 70	SAT	7	8.7	8.8														
FEB 1 70	SUN	7	8.7	8.8														
FEB 2 70	MON	4	6.4	6.6														
FEB 3 70	TUE	4	6.4	6.6														
FEB 4 70	WED	4	8.2	8.1														
FEB 5 70	THU	4	8.2	8.1														
FEB 6 70	FRI																	
FEB 7 70	SAT	4	9.4	10.4														
FEB 8 70	SUN	4	9.4	10.4														

Date of Obsv	Day of Week	Samp Type	F-2 Totl IN P	S-2 Totl IN P	Inf Totl P	P-1 Totl P	F-1 Totl P	S-1 Totl P	P-2 Totl P	F-2 Totl P	S-2 Totl P	Inf Turb	P-1 Turb	F-1 Turb	S-1 Turb	P-2 Turb	F-2 Turb	S-2 Turb
FEB 9 70	MON	4	10.1	10.1														
FEB 10 70	TUE	4	10.1	10.1														
FEB 11 70	WED	4	9.6	9.5														
FEB 12 70	THU	4	9.6	9.5														
FEB 13 70	FRI	7	10.7	11.5														
FEB 14 70	SAT	7	10.7	11.5														
FEB 15 70	SUN	7	10.7	11.5														
FEB 16 70	MON	4	6.6	5.4														
FEB 17 70	TUE	4	6.6	5.4														
FEB 18 70	WED	4	6.7	7.7														
FEB 19 70	THU	4	6.7	7.7														
FEB 20 70	FRI	7	9.3	9.1														
FEB 21 70	SAT	7	9.3	9.1														
FEB 22 70	SUN	7	9.3	9.1														
FEB 23 70	MON	4	10.1	11.1														
FEB 24 70	TUE	4	10.1	11.1														
FEB 25 70	WED	4	9.0	7.8														
FEB 26 70	THU	4	9.0	7.8														
FEB 27 70	FRI																	
FEB 28 70	SAT																	
MAR 1 70	SUN																	
MAR 2 70	MON	4	9.7	10.3														
MAR 3 70	TUE	4	9.7	10.3														
MAR 4 70	WED	4	7.0	6.5														
MAR 5 70	THU	4	7.0	6.5														
MAR 6 70	FRI	7	7.6	8.0														
MAR 7 70	SAT	7	7.6	8.0														
MAR 8 70	SUN	7	7.6	8.0														
MAR 9 70	MON	4	9.7	9.1														
MAR 10 70	TUE	4	9.7	9.1														
MAR 11 70	WED	4	9.8	9.5														
MAR 12 70	THU	4	9.8	9.5														
MAR 13 70	FRI	4	8.8	8.5														
MAR 14 70	SAT	4	8.8	8.5														
MAR 15 70	SUN																	
MAR 16 70	MON	4	10.8	10.5														
MAR 17 70	TUE	4	10.8	10.5														
MAR 18 70	WED	4	9.7	9.5														
MAR 19 70	THU	4	9.7	9.5														
MAR 20 70	FRI																	
MAR 21 70	SAT																	
MAR 22 70	SUN																	
MAR 23 70	MON	4	9.7	9.3														
MAR 24 70	TUE	4	9.7	9.3														
MAR 25 70	WED	4	9.0	8.8														
MAR 26 70	THU	4	9.0	8.8														
MAR 27 70	FRI																	
MAR 28 70	SAT																	
MAR 29 70	SUN																	
MAR 30 70	MON	4	8.2	8.3														
MAR 31 70	TUE	4	8.2	8.3														
APR 1 70	WED																	
APR 2 70	THU																	

Date of Obsv	Day of Week	Samp Type	P-2 Totl IN P	S-2 Totl IN P	Inf Totl P	P-1 Totl P	P-1 Totl P	S-1 Totl P	P-2 Totl P	P-2 Totl P	S-2 Totl P	Inf Turb	P-1 Turb	P-1 Turb	S-1 Turb	P-2 Turb	P-2 Turb	S-2 Turb
APR 3 70	FRI	7	8.6	8.5														
APR 4 70	SAT	7	8.6	8.5														
APR 5 70	SUN	7	8.6	8.5														
APR 6 70	MON	4	9.6	9.6														
APR 7 70	TUE	4	9.6	9.6														
APR 8 70	WED	4																
APR 9 70	THU	4																
APR 10 70	FRI	7																
APR 11 70	SAT	7																
APR 12 70	SUN	7																
APR 13 70	MON																	
APR 14 70	TUE																	
APR 15 70	WED	4	6.9	8.5	10.1				10.3	9.2	10.4							
APR 16 70	THU	4	6.9	8.5	10.1				10.3	9.2	10.4							
APR 17 70	FRI	7	9.7	9.0														
APR 18 70	SAT	7	9.7	9.0														
APR 19 70	SUN	7	9.7	9.0														
APR 20 70	MON																	
APR 21 70	TUE																	
APR 22 70	WED																	
APR 23 70	THU																	
APR 24 70	FRI	7	10.3	9.8	12.4				12.4	12.2	11.4							
APR 25 70	SAT	7	10.3	9.8	12.4				12.4	12.2	11.4							
APR 26 70	SUN	7	10.3	9.8	12.4				12.4	12.2	11.4							
APR 27 70	MON	4																
APR 28 70	TUE	4																
APR 29 70	WED	4																
APR 30 70	THU	4																
MAY 1 70	FRI	7	8.0	7.7	10.4				10.7	10.8	9.8							
MAY 2 70	SAT	7	8.0	7.7	10.4				10.7	10.8	9.8							
MAY 3 70	SUN	7	8.0	7.7	10.4				10.7	10.8	9.8							
MAY 4 70	MON																	
MAY 5 70	TUE																	
MAY 6 70	WED	4	8.1	7.4	10.0				10.5	11.1	10.3							
MAY 7 70	THU	4	8.1	7.4	10.0				10.5	11.1	10.3							
MAY 8 70	FRI																	
MAY 9 70	SAT																	
MAY 10 70	SUN	6	10.2	8.2	11.1				10.8	14.6	11.0							
MAY 11 70	MON																	
MAY 12 70	TUE	6	9.2	9.1	11.2				10.9	11.2	11.0							
MAY 13 70	WED																	
MAY 14 70	THU																	
MAY 15 70	FRI																	
MAY 16 70	SAT																	
MAY 17 70	SUN	6	9.8	9.0	10.7	10.6	11.2	10.3	11.2	12.0	11.1							
MAY 18 70	MON																	
MAY 19 70	TUE																	
MAY 20 70	WED	6	10.1	9.2	10.9	11.2	10.6	10.9	11.0	11.1	10.9							
MAY 21 70	THU	6	6.2	9.9	10.2	10.6	10.6	10.6	11.1	11.2	10.7							
MAY 22 70	FRI																	
MAY 23 70	SAT																	
MAY 24 70	SUN	6	9.6	10.1	10.0	10.1	10.5	10.0	10.7	10.7	10.6							
MAY 25 70	MON																	

Date of Obsv	Day of Week	Samp Type	F-2 Totl IN P	S-2 Totl IN P	Inf Totl P	P-1 Totl P	F-1 Totl P	S-1 Totl P	P-2 Totl P	F-2 Totl P	S-2 Totl P	Inf Turb	P-1 Turb	F-1 Turb	S-1 Turb	P-2 Turb	F-2 Turb	S-2 Turb
MAY 26 70	TUE	6	10.6	10.2	12.4	11.5	12.0	11.8	12.1	12.1	11.4							
MAY 27 70	WED																	
MAY 28 70	THU	6	11.1	10.9	13.1	12.4	13.2	12.6	11.8	11.6	11.6							
MAY 29 70	FRI																	
MAY 30 70	SAT																	
MAY 31 70	SUN	6	10.8	10.6	10.6	11.3	11.6	11.5	12.0	12.0	11.4							
JUN 1 70	MON																	
JUN 2 70	TUE	6	10.1	10.7	11.3	11.2	11.3	11.5	11.7	11.8	11.7							
JUN 3 70	WED																	
JUN 4 70	THU	6	10.9	11.1	11.9	12.0	11.8	11.4	12.5	12.0	12.0							
JUN 5 70	FRI																	
JUN 6 70	SAT																	
JUN 7 70	SUN	6	9.2	9.9	9.7	11.4	11.6	11.5	11.7	12.0	11.6							
JUN 8 70	MON																	
JUN 9 70	TUE	6	10.3	10.5	12.2	13.9	12.6	13.0	13.3	13.0	13.0							
JUN 10 70	WED	9																
JUN 11 70	THU	9		8.9	14.0	12.3	12.3	11.8	12.6		12.4							
JUN 12 70	FRI																	
JUN 13 70	SAT																	
JUN 14 70	SUN	6	10.8	10.0	11.4	11.5	11.8	11.3	11.7	12.0	11.6							
JUN 15 70	MON	6																
JUN 16 70	TUE	6	10.0	10.7	11.4	11.3	11.8	11.4	11.6	11.4	12.0							
JUN 17 70	WED	6																
JUN 18 70	THU	6	9.9	9.9	10.3	10.2	10.9	10.1	10.6	10.3	10.5							
JUN 19 70	FRI																	
JUN 20 70	SAT																	
JUN 21 70	SUN	6	8.7	9.0	9.5	9.6	10.0	9.9	9.6	10.6	9.6							
JUN 22 70	MON	6																
JUN 23 70	TUE	6	8.7	8.8	12.6	10.2	10.2	9.8	10.8	10.0	10.0							
JUN 24 70	WED	6																
JUN 25 70	THU	6	9.0	7.4	12.4	10.2	10.2	10.0	11.0	11.4	10.2							
JUN 26 70	FRI																	
JUN 27 70	SAT																	
JUN 28 70	SUN	6	10.6	10.5	11.2	11.3	11.1	11.5	11.3	11.4	10.7							
JUN 29 70	MON																	
JUN 30 70	TUE	6	10.6	10.3	11.1	10.9	10.8	10.6	10.7	11.0	10.7							
JUL 1 70	WED	6																
JUL 2 70	THU	6	10.0	10.0	10.2	11.1	10.5		10.7	10.2	10.6							
JUL 3 70	FRI																	
JUL 4 70	SAT																	
JUL 5 70	SUN	6	8.9	8.7	10.4	9.5	9.6	10.2	9.9	10.3	9.3							
JUL 6 70	MON	6																
JUL 7 70	TUE	6																
JUL 8 70	WED	6																
JUL 9 70	THU	6	9.6	9.6	9.3	8.1	13.0	12.4	9.7	13.9	9.8							
JUL 10 70	FRI																	
JUL 11 70	SAT																	
JUL 12 70	SUN	6	9.0	8.9	12.0	12.2	13.1	13.0	13.4	13.8	14.3							
JUL 13 70	MON	6																
JUL 14 70	TUE	6																
JUL 15 70	WED																	
JUL 16 70	THU																	
JUL 17 70	FRI																	

Date of Obsv	Day of Week	Samp Type	P-2 Totl IN P	S-2 Totl IN P	Inf Totl P	P-1 Totl P	F-1 Totl P	S-1 Totl P	P-2 Totl P	F-2 Totl P	S-2 Totl P	Inf Turb	P-1 Turb	F-1 Turb	S-1 Turb	P-2 Turb	F-2 Turb	S-2 Turb
JUL 18 70	SAT																	
JUL 19 70	SUN	6																
JUL 20 70	MON	6																
JUL 21 7C	MON																	
JUL 22 70	TUE																	
JUL 23 70	THU	6	10.1	8.3	10.7	10.2	10.1	10.2	10.0	10.2	10.1							
JUL 24 7C	THU																	
JUL 25 70	FRI																	
JUL 26 70	SUN	6	9.7	9.0	10.8	10.8	11.3	10.5	10.7	11.0	11.0							
JUL 27 70	MON	6																
JUL 28 70	TUE	6	8.9	9.6		10.5	10.6	10.7	11.5	14.8	12.0							
JUL 29 70	WED																	
JUL 30 70	THU																	
JUL 31 70	FRI																	
AUG 1 70	SAT																	
AUG 2 70	SUN																	
AUG 3 70	MON																	
AUG 4 70	TUE																	
AUG 5 70	WED	6																
AUG 6 70	THU	6	8.4	9.0	10.4	10.1	10.0	9.8	10.0	9.5	9.5							
AUG 7 70	FRI																	
AUG 8 70	SAT																	
AUG 9 70	SUN	6		9.6	9.5	10.0		10.1	10.1		10.4							
AUG 10 70	MON	6																
AUG 11 70	TUE																	
AUG 12 70	WED	6																
AUG 13 70	THU	6		8.3	9.9	10.5	10.3	10.2	10.3		9.4							
AUG 14 70	FRI																	
AUG 16 70	SUN	6		9.0	10.8	10.3	10.4	10.0	10.2		10.7							
AUG 17 70	MON	6																
AUG 18 70	TUE	11	8.4	8.4	12.1	10.6	10.2	10.1	10.5	9.7	10.5							
AUG 19 70	WED																	
AUG 20 70	THU	6	8.9	9.4	11.2	10.9	10.7	10.6	10.7	10.7	10.3							
AUG 21 70	FRI																	
AUG 23 70	SUN																	
AUG 24 70	MON	6																
AUG 25 70	TUE	6	8.7	9.2	10.5	10.5	10.3	10.1	10.4	10.0	10.0							
AUG 26 70	WED	6																
AUG 27 70	THU	6	9.3	8.7	9.4	9.9	9.8	10.0	10.2	11.5	9.8							
AUG 28 70	FRI																	
AUG 29 70	SAT																	
AUG 30 70	SUN	6	9.5	9.5	9.2	9.9	10.0	10.1		10.4	10.1							
AUG 31 70	MON	6																
SEP 1 70	TUE	6	10.4	10.4	11.7	11.0	10.9	10.6	11.1	11.4	10.6							
SEP 2 70	WED	6																
SEP 3 70	THU	6	9.1	8.7	11.4	9.5	11.4	10.9	11.6	11.0	10.9							
SEP 6 70	SUN																	
SEP 7 70	MON	6																
SEP 8 70	TUE	6																
SEP 8 70	TUE	10	9.1	9.5	12.1	11.3	11.3	11.6	10.8	11.2	11.8							
SEP 9 70	WED																	
SEP 10 70	THU	6																
SEP 10 70	THU	10	9.1	9.5	12.1	11.3	11.3	11.6	10.8	11.2	11.8							

Date of Obsv	Day of Week	Samp Type	F-2 Totl IN P	S-2 Totl IN P	Inf Totl P	P-1 Totl P	F-1 Totl P	S-1 Totl P	P-2 Totl P	F-2 Totl P	S-2 Totl P	Inf Turb	P-1 Turb	F-1 Turb	S-1 Turb	P-2 Turb	F-2 Turb	S-2 Turb
SEP 11 70	FRI																	
SEP 12 70	SAT																	
SEP 13 70	SUN	6																
SEP 13 70	SUN	12	9.8	10.0	11.1	11.0	10.8	10.8	11.3	11.3	10.8							
SEP 14 70	MON	6																
SEP 15 70	TUE	6																
SEP 15 70	TUE	12	9.8		11.1	11.0	10.8	10.8	11.3	11.3								
SEP 16 70	WED	6																
SEP 17 70	THU	12	9.8	10.0	11.1	11.0	10.8	10.8	11.3	11.3	10.8							
SEP 17 70	THU	6																
SEP 18 70	FRI																	
SEP 19 70	SAT																	
SEP 20 70	SUN	6																
SEP 20 70	SUN	12	8.5	8.6	11.0	10.7	11.7	11.0	11.4	11.5	11.1							
SEP 21 70	MON	6																
SEP 22 70	TUE	6																
SEP 22 70	TUE	12	8.5	8.6	11.0	10.7	11.7	11.0	11.4	11.5	11.1							
SEP 23 70	WED	6																
SEP 24 70	THU	12	8.5	8.6	11.0	10.7	11.7	11.0	11.4	11.5	11.1							
SEP 24 70	THU	6																
SEP 25 70	FRI																	
SEP 26 70	SAT																	
SEP 27 70	SUN	6																
SEP 27 70	SUN	12	8.0	9.6	10.6	10.3	10.2	10.1	10.7	10.3	10.2							
SEP 28 70	MON	6																
SEP 29 70	TUE	6																
SEP 29 70	TUE	12	8.0	9.6	10.6	10.3	10.2	10.1	10.7	10.3	10.2							
SEP 30 70	WED	6																
OCT 1 70	THU	12	8.0	9.6	10.6	10.3	10.2	10.1	10.7	10.3	10.2							
OCT 1 70	THU	6																
OCT 2 70	FRI																	
OCT 3 70	SAT																	
OCT 4 70	SUN	4	9.5	9.5	9.8	10.3	11.6	11.6	10.9	11.4	10.7							
OCT 4 70	SUN	13																
OCT 5 70	MON	6																
OCT 6 70	TUE	6																
OCT 6 70	TUE	4	9.5	9.5	9.8	10.3	11.6	11.6	10.9	11.4	10.7							
OCT 8 70	THU																	
OCT 7 70	WED																	
OCT 9 70	FRI																	
OCT 10 70	SAT																	
OCT 11 70	SUN																	
OCT 12 70	MON																	
OCT 13 70	TUE																	
OCT 14 70	WED																	
OCT 15 70	THU																	
OCT 16 70	FRI																	
OCT 17 70	SAT																	
OCT 18 70	SUN	6																
OCT 18 70	SUN	12	10.2	9.2	10.3	9.8	9.9	10.1	10.4	11.7	10.3							
OCT 19 70	MON	6																
OCT 20 70	TUE	12	10.2	9.2	10.3	9.8	9.9	10.1	10.4	11.7	10.3							
OCT 20 70	TUE	6																

Date of Obsv	Day of Week	Samp Type	F-2 Totl IN P	S-2 Totl IN P	Inf Totl P	P-1 Totl P	F-1 Totl P	S-1 Totl P	P-2 Totl P	F-2 Totl P	S-2 Totl P	Inf Turb	P-1 Turb	F-1 Turb	S-1 Turb	P-2 Turb	F-2 Turb	S-2 Turb
OCT 21 70	WED	6																
OCT 22 70	THU	6																
OCT 22 70	THU	12	10.2	9.2	10.3	9.8	9.9	10.1	10.4	11.7	10.3							
OCT 23 70	FRI																	
OCT 24 70	SAT																	
OCT 25 70	SUN	13																
OCT 25 70	SUN	12	9.2	8.1	12.0	12.8	13.9	12.5	13.5	13.8	12.9							
OCT 26 70	MON	6																
OCT 27 70	TUE	6																
OCT 27 70	TUE	12	9.2	8.1	12.0	12.8	13.9	12.5	13.5	13.8	12.9							
OCT 28 70	WED	6																
OCT 29 70	THU	6																
OCT 29 70	THU	12	9.2	8.1	12.0	12.8	13.9	12.5	13.5	13.8	12.9							
OCT 30 70	FRI																	
OCT 31 70	SAT																	
NOV 1 70	SUN	6																
NOV 1 70	SUN	10	5.8	5.7	10.2	9.3	9.5	9.1	8.0	9.9	9.4							
NOV 2 70	MON	6																
NOV 3 70	TUE																	
NOV 4 70	WED																	
NOV 5 70	THU	6																
NOV 5 70	THU	10	5.8	5.7	10.2	9.3	9.5	9.1	8.0	9.9	9.4							
NOV 6 70	FRI																	
NOV 7 70	SAT																	
NOV 8 70	SUN	6																
NOV 8 70	SUN	10	7.9	8.2	11.6	11.4	11.8	11.3	10.7	10.9	11.1							
NOV 9 70	MON	6																
NOV 10 70	TUE	6																
NOV 10 70	TUE	10	7.9	8.2	11.6	11.4	11.8	11.3	10.7	10.9	11.1							
NOV 11 70	WED	6																
NOV 12 70	THU																	
NOV 13 70	FRI																	
NOV 14 70	SAT																	
NOV 15 70	SUN																	
NOV 16 70	MON																	
NOV 17 70	TUE																	
NOV 18 70	WED																	
NOV 19 70	THU																	
NOV 20 70	FRI																	
NOV 21 70	SAT																	
NOV 22 70	SUN																	
NOV 23 70	MON																	
NOV 24 70	TUE	6	8.4	8.6	11.7	10.7	11.2	11.1	11.7	11.5	11.6							
NOV 25 70	THU																	
NOV 26 70	THU																	
NOV 27 70	FRI																	
NOV 28 70	SAT																	
NOV 29 70	SUN	6																
NOV 30 70	MON	6																
DEC 1 70	TUE	6																
DEC 1 70	TUE	12	8.7	8.6	11.5	11.6	11.7	10.5	11.1	11.0	10.9							
DEC 2 70	WED	6																
DEC 3 70	THU	6																

Date of Obsv	Day of Week	Samp Type	F-2 Totl IN P	S-2 Totl IN P	Inf Totl P	P-1 Totl P	F-1 Totl P	S-1 Totl P	P-2 Totl P	F-2 Totl P	S-2 Totl P	Inf Turb	P-1 Turb	F-1 Turb	S-1 Turb	P-2 Turb	F-2 Turb	S-2 Turb
DEC 3 70	THU	12	8.7	8.6	11.5	11.6	11.7	10.5	11.1	11.0	10.9							
DEC 4 70	FRI	99																
DEC 5 70	SAT	99																
DEC 6 70	SUN	6																
DEC 6 70	SUN	12	9.4	9.6	12.9	12.2	12.3	12.5	12.9	12.5	12.7							
DEC 7 70	MON	99																
DEC 8 70	TUE	6																
DEC 8 70	TUE	12	9.4	9.6	12.9	12.2	12.3	12.5	12.9	12.5	12.7							
DEC 9 70	WED	6																
DEC 10 70	THU	6																
DEC 10 70	THU	12	9.4	9.6	12.9	12.2	12.3		12.9	12.5	12.7							
DEC 11 70	FRI	99																
DEC 12 70	SAT	99																
DEC 13 70	SUN	6	8.1	8.8	11.0	12.1	12.3	12.4	11.4	10.7	11.8							
DEC 14 70	MON	6																
DEC 15 70	TUE	6	8.0	9.0	11.9	11.8	11.4	11.5	12.3	11.5	11.9							
DEC 16 70	WED	11																
DEC 17 70	THU	6	6.3	6.5	11.2	9.8	9.8	9.4	10.5	9.3	10.6							
DEC 20 70	SUN	6	7.4	7.2	11.3	10.9	11.5	11.9	11.0	11.5	12.2							
DEC 21 7C	MON	6																
DEC 22 70	TUE	99																
DEC 23 7C	WED	99																
DEC 24 70	THU	99																
DEC 25 70	FRI	99																
DEC 26 70	SAT	99																
DEC 27 70	SUN	6	5.6	6.7	9.8	10.0	9.8	9.4	9.2	9.4	9.8							
DEC 28 70	MON	6																
DEC 29 70	TUE	6	6.5	6.4	11.1	10.6	9.8	9.9	11.1	10.6	10.5							
DEC 30 70	WED	6																
DEC 31 70	THU	99																
JAN 1 71	FRI	99																
JAN 2 71	SAT	99																
JAN 3 71	SUN	6	8.0	8.0	11.2	10.7	10.6	10.3	10.9	10.7	10.9							
JAN 4 71	MON	6																
JAN 5 71	TUE	6	6.1	4.8	7.5	8.1	7.6	9.2	6.4	9.1	7.2							
JAN 6 71	WED	6																
JAN 7 71	THU	6	8.3	8.1	9.7	10.0	8.7	9.2	10.6	11.9	11.2							
JAN 8 71	FRI	99																
JAN 9 71	SAT	99																
JAN 10 71	SUN	6	6.5	7.0	10.0	9.8	10.1	8.7	9.4	10.6	10.9							
JAN 11 71	MON	6																
JAN 12 71	TUE	6	7.7	7.6	8.8	8.8	8.7	8.8		8.8	8.8							
JAN 13 71	WED	6																
JAN 14 71	THU	6	8.0	8.2	9.9	9.2	9.0	8.7	10.3	9.8	10.2							
JAN 15 71	FRI	99																
JAN 16 71	SAT	99																
JAN 17 71	SUN	6	7.6	7.7	12.2	13.5	13.1	13.3	13.6	13.4	12.6							
JAN 18 71	MON	6																
JAN 19 71	TUE	6	8.0	8.4	15.0	14.1	13.7	13.3	13.5	13.6	12.6							
JAN 20 71	WED	6																
JAN 21 71	THU	6	8.4	8.6	14.0	13.6	13.4	13.2	14.0	12.9	14.4							
JAN 22 71	FRI	99																
JAN 23 71	SAT	99																

Date of Obsv	Day of Week	Samp Type	F-2 Totl IN P	S-2 Totl IN P	Inf Totl P	P-1 Totl P	F-1 Totl P	S-1 Totl P	P-2 Totl P	F-2 Totl P	S-2 Totl P	Inf Turb	P-1 Turb	F-1 Turb	S-1 Turb	P-2 Turb	F-2 Turb	S-2 Turb
JAN 24 71	SUN	6	7.5	7.5	13.4	12.9	12.7	13.1	12.3	12.6	12.5							
JAN 25 71	MON	6																
JAN 26 71	TUE	6	8.0	7.8	12.9	12.7	12.4	12.4	12.9	13.4	12.9							
JAN 27 71	WED	6																
JAN 28 71	THU	6	8.3	8.0	13.8	13.5	12.5	12.6	14.8	14.1	13.8							
JAN 29 71	FRI	99																
JAN 30 71	SAT	99																
JAN 31 71	SUN	99																
FEB 1 71	MON	6																
FEB 2 71	TUE	6	8.1	8.0	12.3	10.7	10.3	10.6	10.8	10.3	9.7							
FEB 3 71	WED	6																
FEB 4 71	THU	6	6.5	6.4	7.7	8.0	9.1	7.9	8.3	8.3	7.9							
FEB 5 71	FRI	99																
FEB 6 71	SAT	99																
FEB 7 71	SUN	6	5.0	5.1	5.5	7.0	5.7	6.2	6.1	6.6	6.3							
FEB 8 71	MON	6																
FEB 9 71	TUE	6	6.3	5.9	6.8	7.2	6.4	7.2	7.5	7.3	6.8							
FEB 10 71	WED	6																
FEB 11 71	THU	6	7.8	7.6	8.4	8.9	9.2	9.1	8.3	9.6	9.0							
FEB 12 71	FRI	99																
FEB 13 71	SAT	99																
FEB 14 71	SUN	6	5.5	5.5	9.0	8.1	7.1	6.8	7.6	7.5	7.3							
FEB 15 71	MON	6																
FEB 16 71	TUE	6	7.4	7.3	8.3	8.7	9.2	9.1	9.7	9.1	9.1							
FEB 17 71	WED	6																
FEB 18 71	THU	6	8.0	7.7	9.7	9.7	9.9	9.7	10.2	10.3	10.1							
FEB 19 71	FRI	99																
FEB 20 71	SAT	99																
FEB 21 71	SUN	6	8.1	8.7	10.5	11.5	10.9	11.0	11.0	10.6	10.9							
FEB 22 71	MON	6																
FEB 23 71	TUE	6	7.2	6.7	8.8	8.4	10.4	9.2	9.0	9.2	8.4							
FEB 24 71	WED	6																
FEB 25 71	THU	6	8.2	7.9	9.6	10.0	10.1	10.2	9.8	10.1	9.8							
FEB 26 71	FRI	99																
FEB 27 71	SAT	99																
FEB 28 71	SUN	6	8.8	8.5	9.1	10.0	10.4	10.1	10.8	11.0	9.8							
MAR 1 71	MON	6																
MAR 2 71	TUE	6	8.0	8.1	9.7	8.8	9.1	8.8	9.2	9.3	8.8							
MAR 3 71	WED	6																
MAR 4 71	THU	6	5.2	5.2	7.1	6.9	6.5	6.2	7.2	6.2	6.0							
MAR 5 71	FRI	99																
MAR 6 71	SAT	99																
MAR 7 71	SUN	6	4.7	4.5	7.9	8.8	8.6	8.6	9.0	9.4	8.4							
MAR 8 71	MON	6																
MAR 9 71	TUE	6	4.6	4.9	9.5	9.0	9.4	9.0	9.8	9.6	9.4							
MAR 10 71	WED	6																
MAR 11 71	THU	6																
MAR 12 71	FRI	99																
MAR 13 71	SAT	99																
MAR 14 71	SUN	6																
MAR 15 71	MON	6																
MAR 16 71	TUE	6																
MAR 17 71	WED	6																

Date of Obsv	Day of Week	Samp Type	F-2 Totl IN P	S-2 Totl IN P	Inf Totl P	P-1 Totl P	F-1 Totl P	S-1 Totl P	P-2 Totl P	F-2 Totl P	S-2 Totl P	Inf Turb	P-1 Turb	F-1 Turb	S-1 Turb	P-2 Turb	F-2 Turb	S-2 Turb
MAR 18 71	THU	6																
MAR 19 71	FRI	99																
MAR 20 71	SAT	99																
MAR 21 71	SUN	6																
MAR 22 71	MON	6																
MAR 23 71	TUE	6	9.6	8.9	8.9	10.6	10.6	10.3	10.4	10.6	10.4							
MAR 24 71	WED	6																
MAR 25 71	THU	6																
MAR 26 71	FRI	99																
MAR 27 71	SAT	99																
MAR 28 71	SUN	6																
MAR 29 71	MON	6																
MAR 30 71	TUE	6																
MAR 31 71	WED	6																
APR 1 71	THU	6																
APR 2 71	FRI	99																
APR 3 71	SAT	99																
APR 4 71	SUN	6																
APR 5 71	MON	6																
APR 6 71	TUE	6	6.1	6.0	7.7	7.4	7.2	6.6	8.0	7.3	6.9							
APR 7 71	WED	6																
APR 8 71	THU	6																
APR 9 71	FRI	99																
APR 10 71	SAT	99																
APR 11 71	SUN	99																
APR 12 71	MON	6																
APR 13 71	TUE	6																
APR 14 71	WED	6																
APR 15 71	THU	6																
APR 16 71	FRI	99																
APR 17 71	SAT	99																
APR 18 71	SUN	6																
APR 19 71	MON	6																
APR 20 71	TUE	6																
APR 21 71	WED	6																
APR 22 71	THU	6	8.5	8.2	10.2	8.9	9.6	9.4	9.9	10.4	9.8							
APR 23 71	FRI	99																
APR 24 71	SAT	99																
APR 25 71	SUN	6																
APR 26 71	MON	6																
APR 27 71	TUE	6																
APR 28 71	WED	6																
APR 29 71	THU	6																
APR 30 71	FRI	99																
MAY 1 71	SAT	99																
MAY 2 71	SUN	6																
MAY 3 71	MON	6																
MAY 4 71	TUE	6	7.4	7.4	9.7	9.5	10.3	10.5	9.6	10.3	9.6							
MAY 5 71	WED	99																
MAY 6 71	THU	6																
MAY 7 71	FRI	99																
MAY 8 71	SAT	99																
MAY 9 71	SUN	6																

Date of Obsv	Day of Week	Samp Type	F-2 Totl IN P	S-2 Totl IN P	Inf Totl P	P-1 Totl P	F-1 Totl P	S-1 Totl P	P-2 Totl P	F-2 Totl P	S-2 Totl P	Inf Turb	P-1 Turb	F-1 Turb	S-1 Turb	P-2 Turb	F-2 Turb	S-2 Turb
MAY 10 71	MON	99																
MAY 11 71	TUE	99																
MAY 12 71	WED	99																
MAY 13 71	THU	99																
MAY 14 71	FRI	99																
MAY 15 71	SAT	99																
MAY 16 71	SUN	6																
MAY 17 71	MON	6																
MAY 18 71	TUE	6																
MAY 19 71	WED	99																
MAY 20 71	THU	6																
MAY 21 71	FRI	99																
MAY 22 71	SAT	99																
MAY 23 71	SUN	6																
MAY 24 71	MON	6																
MAY 25 71	TUE	6																
MAY 26 71	WED	6																
MAY 27 71	THU	6																
MAY 28 71	FRI	99																
MAY 29 71	SAT	99																
MAY 30 71	SUN	99																
MAY 31 71	MON	6																
JUN 1 71	TUE	6																
JUN 2 71	WED	6																
JUN 3 71	THU	6																
JUN 4 71	FRI	99																
JUN 5 71	SAT	99																
JUN 6 71	SUN	6																
JUN 7 71	MON	6																
JUN 8 71	TUE	6																
JUN 9 71	WED	6																
JUN 10 71	THU	6																
JUN 11 71	FRI	99																
JUN 12 71	SAT	99																
JUN 13 71	SUN	6																
JUN 14 71	MON	6																
JUN 15 71	TUE	6																
JUN 16 71	WED	6																
JUN 17 71	THU	99																
JUN 18 71	FRI	99																
JUN 19 71	SAT	99																
JUN 20 71	SUN	99																
JUN 21 71	MON	99																
JUN 22 71	TUE	6																
JUN 23 71	WED	99																
JUN 24 71	THU	6																
JUN 25 71	FRI	99																
JUN 26 71	SAT	6																
JUN 27 71	SUN	99																
JUN 28 71	MON	6																
JUN 29 71	TUE	6																
JUN 30 71	WED	6																
JUL 1 71	THU	6																

Date of Obsv	Day of Week	Samp Type	P-2 Totl IN P	S-2 Totl IN P	Inf Totl P	P-1 Totl P	F-1 Totl P	S-1 Totl P	P-2 Totl P	F-2 Totl P	S-2 Totl P	Inf Turb	P-1 Turb	F-1 Turb	S-1 Turb	P-2 Turb	F-2 Turb	S-2 Turb
JUL 2 71	FRI	99																
JUL 3 71	SAT	99																
JUL 4 71	SUN	99																
JUL 5 71	MON	6																
JUL 6 71	TUE	6																
JUL 7 71	WED	6																
JUL 8 71	THU	6	7.9	7.0	10.0	9.2	8.7	9.5	9.5	9.2	8.2							
JUL 9 71	FRI	99																
JUL 10 71	SAT	6																
JUL 11 71	SUN	99																
JUL 12 71	MON	6																
JUL 13 71	TUE	6																
JUL 14 71	WED	6																
JUL 15 71	THU	6	8.4	8.0	11.3	11.1	10.4	10.0	10.3	10.2	9.6							
JUL 16 71	FRI	99																
JUL 17 71	SAT	6																
JUL 18 71	SUN	99																
JUL 19 71	MON	6																
JUL 20 71	TUE	6																
JUL 21 71	WED	6																
JUL 22 71	THU	6	8.1	8.3	11.2	9.6	9.5	9.2	9.3	9.2	9.2							
JUL 23 71	FRI	99																
JUL 24 71	SAT	6																
JUL 25 71	SUN	99																
JUL 26 71	MON	6																
JUL 27 71	TUE	6																
JUL 28 71	WED	6																
JUL 29 71	THU	6																
JUL 30 71	FRI	99																
JUL 31 71	SAT	99																
AUG 1 71	SUN	99																
AUG 2 71	MON	6																
AUG 3 71	TUE	6																
AUG 4 71	WED	6																
AUG 5 71	THU	6	6.8	6.8	9.5	8.5	8.3	7.9	9.0	8.4	7.8							
AUG 6 71	FRI	99																
AUG 7 71	SAT	99																
AUG 8 71	SUN	99																
AUG 9 71	MON	6																
AUG 10 71	TUE	6																
AUG 11 71	WED	6																
AUG 12 71	THU	6	7.9	7.8	14.0	11.3	9.7	9.2	10.0	9.3	8.6							
AUG 13 71	FRI	99																
AUG 14 71	SAT	6																
AUG 15 71	SUN	99																
AUG 16 71	MON	6																
AUG 17 71	TUE	6		7.8	8.3	10.0	8.5	8.5	9.1		8.1							
AUG 18 71	WED	6																
AUG 19 71	THU	6	7.4	7.3	9.0	9.3	7.8	9.2	9.7	9.1	8.4							
AUG 20 71	FRI	99																
AUG 21 71	SAT	6																
AUG 22 71	SUN	99																
AUG 23 71	MON	6																

Date of Obsv	Day of Week	Samp Type	F-2 Totl IN P	S-2 Totl IN P	Inf Totl P	P-1 Totl P	F-1 Totl P	S-1 Totl P	P-2 Totl P	F-2 Totl P	S-2 Totl P	Inf Turb	P-1 Turb	F-1 Turb	S-1 Turb	P-2 Turb	F-2 Turb	S-2 Turb
AUG 24 71	TUE	6	8.1	8.4	9.1	8.9	8.8	8.2	8.2	8.8	8.5							
AUG 25 71	WED	6																
AUG 26 71	THU	6	8.3	7.8	8.9	8.6	8.6	8.1	8.3	9.7	8.1							
AUG 27 71	FRI	99																
AUG 28 71	SAT	6																
AUG 29 71	SUN	99																
AUG 30 71	MON	6																
AUG 31 71	TUE	6	7.9	7.1	9.2	9.9	9.4	8.8	9.7	9.4	8.8							
SEP 1 71	WED	6																
SEP 2 71	THU	6	7.2	6.9	9.9	9.7	9.1	9.1	9.2	9.2	9.9							
SEP 3 71	FRI	99																
SEP 4 71	SAT	99																
SEP 5 71	SUN	99																
SEP 6 71	MON	99																
SEP 7 71	TUE	6	4.6	9.0	10.3	10.0	10.0	10.0	10.6	10.4								
SEP 8 71	WED	6																
SEP 9 71	THU	6		8.5	9.7	10.7	11.2	10.3	10.9		9.8							
SEP 10 71	FRI	99																
SEP 11 71	SAT	6																
SEP 12 71	SUN	99																
SEP 13 71	MON	6																
SEP 14 71	TUE	99																
SEP 15 71	WED	6																
SEP 16 71	THU	6	7.6	8.1	9.3	9.4	9.0	8.7	9.4	9.0	9.8							
SEP 17 71	FRI	99																
SEP 18 71	SAT	6																
SEP 19 71	SUN	99																
SEP 20 71	MON	6																
SEP 21 71	TUE	6	6.7	6.2	8.2	7.8	8.2	7.8	7.6	8.2	7.6							
SEP 22 71	WED	6																
SEP 23 71	THU	6		7.3	9.0	8.4	8.2	8.5	9.4		8.8							
SEP 24 71	FRI	99																
SEP 25 71	SAT	6																
SEP 26 71	SUN	99																
SEP 27 71	MON	6																
SEP 28 71	TUE	99																
SEP 29 71	WED	99																
SEP 30 71	THU	6																
OCT 1 71	FRI	99																
OCT 2 71	SAT	6																
OCT 3 71	SUN	99																
OCT 4 71	MON	6																
OCT 5 71	TUE	6																
OCT 6 71	WED	6																
OCT 7 71	THU	99																
OCT 8 71	FRI	99																
OCT 9 71	SAT	99																
OCT 10 71	SUN	6																
OCT 11 71	MON	6																
OCT 12 71	TUE	6																
OCT 13 71	WED	6																
OCT 14 71	THU	6																
OCT 15 71	FRI	99																

Date of Obsv	Day of Week	Samp Type	F-2 Totl IN P	S-2 Totl IN P	Inf Totl P	P-1 Totl P	F-1 Totl P	S-1 Totl P	P-2 Totl P	F-2 Totl P	S-2 Totl P	Inf Turb	P-1 Turb	F-1 Turb	S-1 Turb	P-2 Turb	F-2 Turb	S-2 Turb
OCT 16 71	SAT	6																
OCT 17 71	SUN	99																
OCT 18 71	MON	6																
OCT 19 71	TUE	6																
OCT 20 71	WED	6																
OCT 21 71	THU	6																
OCT 22 71	FRI	99																
OCT 23 71	SAT	6																
OCT 24 71	SUN	99																
OCT 25 71	MON	99																
OCT 26 71	TUE	99																
OCT 27 71	WED	99																
OCT 28 71	THU	99																
OCT 29 71	FRI	99																
OCT 30 71	SAT	99																
OCT 31 71	SUN	99																
NOV 1 71	MON	6																
NOV 2 71	TUE	6																
NOV 3 71	WED	6																
NOV 4 71	THU	99																
NOV 5 71	FRI	99																
NOV 6 71	SAT	99																
NOV 7 71	SUN	99																
NOV 8 71	MON	99																
NOV 9 71	TUE	99																
NOV 10 71	WED	6																
NOV 11 71	THU	6																
NOV 12 71	FRI	99																
NOV 13 71	SAT	6																
NOV 14 71	SUN	99																
NOV 15 71	MON	6																
NOV 16 71	TUE	6																
NOV 17 71	WED	6																
NOV 18 71	THU	6																
NOV 19 71	FRI	99																
NOV 20 71	SAT	6																
NOV 21 71	SUN	99																
NOV 22 71	MON	6																
NOV 23 71	TUE	6																
NOV 24 71	WED	99																
NOV 25 71	THU	99																
NOV 26 71	FRI	99																
NOV 27 71	SAT	6																
NOV 28 71	SUN	99																
NOV 29 71	MON	6																
NOV 30 71	TUE	15																
DEC 1 71	WED	15																
DEC 2 71	THU	15																
DEC 3 71	FRI	99																
DEC 4 71	SAT	15																
DEC 5 71	SUN	99																
DEC 6 71	MON	15																
DEC 7 71	TUE	15																

Date of Obsv	Day of Week	Samp Type	P-2 Totl IN P	S-2 Totl IN P	Inf Totl P	P-1 Totl P	F-1 Totl P	S-1 Totl P	P-2 Totl P	F-2 Totl P	S-2 Totl P	Inf Turb	P-1 Turb	F-1 Turb	S-1 Turb	P-2 Turb	F-2 Turb	S-2 Turb
DEC 8 71	WED	15																
DEC 9 71	THU	15																
DEC 10 71	FRI	99																
DEC 11 71	SAT	15																
DEC 12 71	SUN	99																
DEC 13 71	MON	15																
DEC 14 71	TUE	15																
DEC 15 71	WED	15																
DEC 17 71	FRI	99																
DEC 18 71	SAT	15																
DEC 19 71	SUN	99																
DEC 20 71	MON	15																
DEC 21 71	TUE	99																
DEC 22 71	WED	99																
DEC 23 71	THU	99																
DEC 24 71	FRI	99																
DEC 25 71	SAT	99																
DEC 26 71	SUN	99																
DEC 27 71	MON	99																
DEC 28 71	TUE	15																
DEC 29 71	WED	15																
DEC 30 71	THU	15																
DEC 31 71	FRI	99																
JAN 1 72	SAT	99																
JAN 2 72	SUN	99																
JAN 3 72	MON	15																
JAN 4 72	TUE	15																
JAN 5 72	WED	15																
JAN 6 72	THU	15																
JAN 7 72	FRI	99																
JAN 8 72	SAT	15																
JAN 9 72	SUN	99																
JAN 10 72	MON	15																
JAN 11 72	TUE	15	6.3	6.1	7.1	6.3		6.1	6.5	6.5	6.7							
JAN 12 72	WED	15																
JAN 13 72	THU	99																
JAN 14 72	FRI	99																
JAN 15 72	SAT	15																
JAN 16 72	SUN	99																
JAN 17 72	MON	15																
JAN 18 72	TUE	15	8.5	8.4	13.5	12.0	11.7	11.0	11.9	12.7	12.7							
JAN 19 72	WED	15																
JAN 20 72	THU	15	8.8	8.2	15.8	12.0	13.9	11.7	14.5	14.6	12.9							
JAN 21 72	FRI	99																
JAN 22 72	SAT	15																
JAN 23 72	SUN	99																
JAN 24 72	MON	15																

Date of Obsv	Day of Week	Samp Type	Inf PH	P-1 PH	F-1 PH	S-1 PH	P-2 PH	F-2 PH	S-2 PH
NOV 19 69	WED	6							
NOV 19 69	WED	4							
NOV 20 69	THU	6							
NOV 20 69	THU	4							
NOV 21 69	FRI	6							
NOV 21 69	FRI	7							
NOV 22 69	SAT	4							
NOV 22 69	SAT	7							
NOV 23 69	SUN	4							
NOV 23 69	SUN	7							
NOV 24 69	MON	6							
NOV 24 69	MON	4							
NOV 25 69	TUE	6							
NOV 25 69	TUE	4							
NOV 26 69	WED								
NOV 27 69	THU								
NOV 28 69	FRI								
NOV 29 69	SAT	4							
NOV 30 69	SUN	4							
DEC 1 69	MON	6							
DEC 1 69	MON	4							
DEC 2 69	TUE	6							
DEC 2 69	TUE	4							
DEC 3 69	WED	6							
DEC 3 69	WED	4							
DEC 4 69	THU	6							
DEC 4 69	THU	4							
DEC 5 69	FRI	6							
DEC 5 69	FRI	7							
DEC 6 69	SAT	4							
DEC 6 69	SAT	7							
DEC 7 69	SUN	4							
DEC 7 69	SUN	7							
DEC 8 69	MON	6							
DEC 8 69	MON	4							
DEC 9 69	TUE	6							
DEC 9 69	TUE	4							
DEC 10 69	WED	6							
DEC 10 69	WED	4							
DEC 11 69	THU	6							
DEC 11 69	THU	4							
DEC 12 69	FRI	7							
DEC 12 69	FRI	6							
DEC 13 69	SAT	7							
DEC 13 69	SAT	4							
DEC 14 69	SUN	7							
DEC 14 69	SUN	4							
DEC 15 69	MON	4							
DEC 15 69	MON	6							
DEC 16 69	TUE	6							
DEC 16 69	TUE	4							
DEC 17 69	WED	6							
DEC 17 69	WED	4							

Date of Obsv			Day of Week	Samp Type	Inf PH	P-1 PH	F-1 PH	S-1 PH	P-2 PH	F-2 PH	S-2 PH
DEC	18	69	THU	6							
DEC	18	69	THU	4							
DEC	19	69	FRI								
DEC	20	69	SAT								
DEC	21	69	SUN								
DEC	22	69	MON								
DEC	23	69	TUE								
DEC	24	69	WED								
DEC	25	69	THU								
DEC	26	69	FRI								
DEC	27	69	SAT								
DEC	28	69	SUN								
DEC	29	69	MON	6							
DEC	29	69	MON	4							
DEC	30	69	TUE	6							
DEC	30	69	TUE	4							
JAN	1	70	THU								
JAN	2	70	FRI								
JAN	5	70	MON								
JAN	6	70	TUE								
JAN	7	70	WED								
JAN	8	70	THU								
JAN	9	70	FRI								
JAN	10	70	SAT								
JAN	11	70	SUN								
JAN	12	70	MON								
JAN	13	70	TUE								
JAN	14	70	WED								
JAN	15	70	THU								
JAN	16	70	FRI								
JAN	17	70	SAT	4							
JAN	18	70	SUN	4							
JAN	19	70	MON	4							
JAN	20	70	TUE	4							
JAN	21	70	WED	4							
JAN	22	70	THU	4							
JAN	23	70	FRI	7							
JAN	24	70	SAT	7							
JAN	25	70	SUN	7							
JAN	26	70	MON	4							
JAN	27	70	TUE	4							
JAN	28	70	WED	4							
JAN	29	70	THU	4							
JAN	30	70	FRI	7							
JAN	31	70	SAT	7							
FEB	1	70	SUN	7							
FEB	2	70	MON	4							
FEB	3	70	TUE	4							
FEB	4	70	WED	4							
FEB	5	70	THU	4							
FEB	6	70	FRI								
FEB	7	70	SAT	4							
FEB	8	70	SUN	4							

Date of Obsv	Day of Week	Samp Type	Inf PH	P-1 PH	F-1 PH	S-1 PH	P-2 PH	F-2 PH	S-2 PH
FEB 9 70	MON	4							
FEB 10 70	TUE	4							
FEB 11 70	WED	4							
FEB 12 70	THU	4							
FEB 13 70	FRI	7							
FEB 14 70	SAT	7							
FEB 15 70	SUN	7							
FEB 16 70	MON	4							
FEB 17 70	TUE	4							
FEB 18 70	WED	4							
FEB 19 70	THU	4							
FEB 20 70	FRI	7							
FEB 21 70	SAT	7							
FEB 22 70	SUN	7							
FEB 23 70	MON	4							
FEB 24 70	TUE	4							
FEB 25 70	WED	4							
FEB 26 70	THU	4							
FEB 27 70	FRI								
FEB 28 70	SAT								
MAR 1 70	SUN								
MAR 2 70	MON	4							
MAR 3 70	TUE	4							
MAR 4 70	WED	4							
MAR 5 70	THU	4							
MAR 6 70	FRI	7							
MAR 7 70	SAT	7							
MAR 8 70	SUN	7							
MAR 9 70	MON	4							
MAR 10 70	TUE	4							
MAR 11 70	WED	4							
MAR 12 70	THU	4							
MAR 13 70	FRI	4							
MAR 14 70	SAT	4							
MAR 15 70	SUN								
MAR 16 70	MON	4							
MAR 17 70	TUE	4							
MAR 18 70	WED	4							
MAR 19 70	THU	4							
MAR 20 70	FRI								
MAR 21 70	SAT								
MAR 22 70	SUN								
MAR 23 70	MON	4							
MAR 24 70	TUE	4							
MAR 25 70	WED	4							
MAR 26 70	THU	4							
MAR 27 70	FRI								
MAR 28 70	SAT								
MAR 29 70	SUN								
MAR 30 70	MON	4							
MAR 31 70	TUE	4							
APR 1 70	WED								
APR 2 70	THU								

Date of Obsv	Day of Week	Samp Type	Inf PH	P-1 PH	F-1 PH	S-1 PH	P-2 PH	F-2 PH	S-2 PH
APR 3 70	FRI	7							
APR 4 70	SAT	7							
APR 5 70	SUN	7							
APR 6 70	MON	4							
APR 7 70	TUE	4							
APR 8 70	WED	4							
APR 9 70	THU	4							
APR 10 70	FRI	7							
APR 11 70	SAT	7							
APR 12 70	SUN	7							
APR 13 70	MON								
APR 14 70	TUE								
APR 15 70	WED	4							
APR 16 70	THU	4							
APR 17 70	FRI	7							
APR 18 70	SAT	7							
APR 19 70	SUN	7							
APR 20 70	MON								
APR 21 70	TUE								
APR 22 70	WED								
APR 23 70	THU								
APR 24 70	FRI	7							
APR 25 70	SAT	7							
APR 26 70	SUN	7							
APR 27 70	MON	4							
APR 28 70	TUE	4							
APR 29 70	WED	4							
APR 30 70	THU	4							
MAY 1 70	FRI	7							
MAY 2 70	SAT	7							
MAY 3 70	SUN	7							
MAY 4 70	MON								
MAY 5 70	TUE								
MAY 6 70	WED	4							
MAY 7 70	THU	4							
MAY 8 70	FRI								
MAY 9 70	SAT								
MAY 10 70	SUN	6							
MAY 11 70	MON								
MAY 12 70	TUE	6							
MAY 13 70	WED								
MAY 14 70	THU								
MAY 15 70	FRI								
MAY 16 70	SAT								
MAY 17 70	SUN	6							
MAY 18 70	MON								
MAY 19 70	TUE								
MAY 20 70	WED	6							
MAY 21 70	THU	6							
MAY 22 70	FRI								
MAY 23 70	SAT								
MAY 24 70	SUN	6							
MAY 25 70	MON								

Date of Obsv	Day of Week	Samp Type	Inf PH	P-1 PH	F-1 PH	S-1 PH	P-2 PH	F-2 PH	S-2 PH
MAY 26 70	TUE	6							
MAY 27 70	WED								
MAY 28 70	THU	6							
MAY 29 70	FRI								
MAY 30 70	SAT								
MAY 31 70	SUN	6							
JUN 1 70	MON								
JUN 2 70	TUE	6							
JUN 3 70	WED								
JUN 4 70	THU	6							
JUN 5 70	FRI								
JUN 6 70	SAT								
JUN 7 70	SUN	6							
JUN 8 70	MON								
JUN 9 70	TUE	6							
JUN 10 70	WED	9							
JUN 11 70	THU	9							
JUN 12 70	FRI								
JUN 13 70	SAT								
JUN 14 70	SUN	6							
JUN 15 70	MON	6							
JUN 16 70	TUE	6							
JUN 17 70	WED	6							
JUN 18 70	THU	6							
JUN 19 70	FRI								
JUN 20 70	SAT								
JUN 21 70	SUN	6							
JUN 22 70	MON	6							
JUN 23 70	TUE	6							
JUN 24 70	WED	6							
JUN 25 70	THU	6							
JUN 26 70	FRI								
JUN 27 70	SAT								
JUN 28 70	SUN	6							
JUN 29 70	MON								
JUN 30 70	TUE	6							
JUL 1 70	WED	6							
JUL 2 70	THU	6							
JUL 3 70	FRI								
JUL 4 70	SAT								
JUL 5 70	SUN	6							
JUL 6 70	MON	6							
JUL 7 70	TUE	6							
JUL 8 70	WED	6							
JUL 9 70	THU	6							
JUL 10 70	FRI								
JUL 11 70	SAT								
JUL 12 70	SUN	6							
JUL 13 70	MON	6							
JUL 14 70	TUE	6							
JUL 15 70	WED								
JUL 16 70	THU								
JUL 17 70	FRI								

Date of Obsv	Day of Week	Samp Type	Inf PH	P-1 PH	F-1 PH	S-1 PH	P-2 PH	F-2 PH	S-2 PH
JUL 18 70	SAT								
JUL 19 70	SUN	6							
JUL 20 70	MON	6							
JUL 21 70	MON								
JUL 22 70	TUE								
JUL 23 70	THU	6							
JUL 24 70	THU								
JUL 25 70	FRI								
JUL 26 70	SUN	6							
JUL 27 70	MON	6							
JUL 28 70	TUE	6							
JUL 29 70	WED								
JUL 30 70	THU								
JUL 31 70	FRI								
AUG 1 70	SAT								
AUG 2 70	SUN								
AUG 3 70	MON								
AUG 4 70	TUE								
AUG 5 70	WED	6							
AUG 6 70	THU	6							
AUG 7 70	FRI								
AUG 8 70	SAT								
AUG 9 70	SUN	6							
AUG 10 70	MON	6							
AUG 11 70	TUE								
AUG 12 70	WED	6							
AUG 13 70	THU	6							
AUG 14 70	FRI								
AUG 16 70	SUN	6							
AUG 17 70	MON	6							
AUG 18 70	TUE	11							
AUG 19 70	WED								
AUG 20 70	THU	6							
AUG 21 70	FRI								
AUG 23 70	SUN								
AUG 24 70	MON	6							
AUG 25 70	TUE	6							
AUG 26 70	WED	6							
AUG 27 70	THU	6							
AUG 28 70	FRI								
AUG 29 70	SAT								
AUG 30 70	SUN	6							
AUG 31 70	MON	6							
SEP 1 70	TUE	6							
SEP 2 70	WED	6							
SEP 3 70	THU	6							
SEP 6 70	SUN								
SEP 7 70	MON	6							
SEP 8 70	TUE	6							
SEP 8 70	TUE	10							
SEP 9 70	WED								
SEP 10 70	THU	6							
SEP 10 70	THU	10							

Date of Obsv	Day of Week	Samp Type	Inf PH	P-1 PH	F-1 PH	S-1 PH	P-2 PH	F-2 PH	S-2 PH
		--	--.-	--.-	--.-	--.-	--.-	--.-	--.-
SEP 11 70	FRI								
SEP 12 70	SAT								
SEP 13 70	SUN	6							
SEP 13 70	SUN	12							
SEP 14 70	MON	6							
SEP 15 70	TUE	6							
SEP 15 70	TUE	12							
SEP 16 70	WED	6							
SEP 17 70	THU	12							
SEP 17 70	THU	6							
SEP 18 70	FRI								
SEP 19 70	SAT								
SEP 20 70	SUN	6							
SEP 20 70	SUN	12							
SEP 21 70	MON	6							
SEP 22 70	TUE	6							
SEP 22 70	TUE	12							
SEP 23 70	WED	6							
SEP 24 70	THU	12							
SEP 24 70	THU	6							
SEP 25 70	FRI								
SEP 26 70	SAT								
SEP 27 70	SUN	6							
SEP 27 70	SUN	12							
SEP 28 70	MON	6							
SEP 29 70	TUE	6							
SEP 29 70	TUE	12							
SEP 30 70	WED	6							
OCT 1 70	THU	12							
OCT 1 70	THU	6							
OCT 2 70	FRI								
OCT 3 70	SAT								
OCT 4 70	SUN	4							
OCT 4 70	SUN	13							
OCT 5 70	MON	6							
OCT 6 70	TUE	6							
OCT 6 70	TUE	4							
OCT 8 70	THU								
OCT 7 70	WED								
OCT 9 70	FRI								
OCT 10 70	SAT								
OCT 11 70	SUN								
OCT 12 70	MON								
OCT 13 70	TUE								
OCT 14 70	WED								
OCT 15 70	THU								
OCT 16 70	FRI								
OCT 17 70	SAT								
OCT 18 70	SUN	6							
OCT 18 70	SUN	12							
OCT 19 70	MON	6							
OCT 20 70	TUE	12							
OCT 20 70	TUE	6							

Date of Obsv	Day of Week	Samp Type	Inf PH	P-1 PH	F-1 PH	S-1 PH	P-2 PH	F-2 PH	S-2 PH
OCT 21 70	WED	6							
OCT 22 70	THU	6							
OCT 22 70	THU	12							
OCT 23 70	FRI								
OCT 24 70	SAT								
OCT 25 70	SUN	13							
OCT 25 70	SUN	12							
OCT 26 70	MON	6							
OCT 27 70	TUE	6							
OCT 27 70	TUE	12							
OCT 28 70	WED	6							
OCT 29 70	THU	6							
OCT 29 70	THU	12							
OCT 30 70	FRI								
OCT 31 70	SAT								
NOV 1 70	SUN	6							
NOV 1 70	SUN	10							
NOV 2 70	MON	6							
NOV 3 70	TUE								
NOV 4 70	WED								
NOV 5 70	THU	6							
NOV 5 70	THU	10							
NOV 6 70	FRI								
NOV 7 70	SAT								
NOV 8 70	SUN	6							
NOV 8 70	SUN	10							
NOV 9 70	MON	6							
NOV 10 70	TUE	6							
NOV 10 70	TUE	10							
NOV 11 70	WED	6							
NOV 12 70	THU								
NOV 13 70	FRI								
NOV 14 70	SAT								
NOV 15 70	SUN								
NOV 16 70	MON								
NOV 17 70	TUE								
NOV 18 70	WED								
NOV 19 70	THU								
NOV 20 70	FRI								
NOV 21 70	SAT								
NOV 22 70	SUN								
NOV 23 70	MON								
NOV 24 70	TUE	6							
NOV 25 70	THU								
NOV 26 70	THU								
NOV 27 70	FRI								
NOV 28 70	SAT								
NOV 29 70	SUN	6							
NOV 30 70	MON	6							
DEC 1 70	TUE	6							
DEC 1 70	TUE	12							
DEC 2 70	WED	6							
DEC 3 70	THU	6							

Date of Obsv	Day of Week	Samp Type	Inf PH	P-1 PH	F-1 PH	S-1 PH	P-2 PH	F-2 PH	S-2 PH
--- -- --	---	--	--.-	--.-	--.-	--.-	--.-	--.-	--.-
DEC 3 70	THU	12							
DEC 4 70	FRI	99							
DEC 5 70	SAT	99							
DEC 6 70	SUN	6							
DEC 6 70	SUN	12							
DEC 7 70	MON	99							
DEC 8 70	TUE	6							
DEC 8 70	TUE	12							
DEC 9 70	WED	6							
DEC 10 70	THU	6							
DEC 10 70	THU	12							
DEC 11 70	FRI	99							
DEC 12 70	SAT	99							
DEC 13 70	SUN	6							
DEC 14 70	MON	6							
DEC 15 70	TUE	6	6.7	6.8	6.7	6.7	6.7	6.7	6.8
DEC 16 70	WED	11	7.0	7.1	7.0	7.0	7.0	7.0	7.2
DEC 17 70	THU	6	7.3	7.5	7.2	7.2	7.3	7.2	7.4
DEC 20 70	SUN	6	7.4	7.3	7.2	7.2	7.4	7.4	7.4
DEC 21 70	MON	6	7.4	7.3	7.2	7.2	7.4	7.3	7.4
DEC 22 70	TUE	99							
DEC 23 70	WED	99							
DEC 24 70	THU	99							
DEC 25 70	FRI	99							
DEC 26 70	SAT	99							
DEC 27 70	SUN	6	7.5	7.3	7.0	7.0	7.3	7.4	7.3
DEC 28 70	MON	6	7.6	7.4	7.2	7.3	7.5	7.6	7.6
DEC 29 70	TUE	6	7.5	7.5	7.2	7.2	7.5	7.4	7.4
DEC 30 70	WED	6	7.4	7.3	7.3	7.3	7.4	7.4	7.3
DEC 31 70	THU	99							
JAN 1 71	FRI	99							
JAN 2 71	SAT	99							
JAN 3 71	SUN	6	7.3	7.3	7.2	7.2	7.4	7.4	7.4
JAN 4 71	MON	6	7.2	7.4	7.4	7.4	7.4	7.4	7.4
JAN 5 71	TUE	6	7.4	7.4	7.4	7.4	7.4	7.4	7.4
JAN 6 71	WED	6	7.6	7.6	7.5	7.5	7.6	7.7	7.6
JAN 7 71	THU	6							
JAN 8 71	FRI	99							
JAN 9 71	SAT	99							
JAN 10 71	SUN	6							
JAN 11 71	MON	6	7.4	7.6	7.6	7.6	7.5	7.6	7.6
JAN 12 71	TUE	6							
JAN 13 71	WED	6	7.7	7.6	7.6	7.7		7.7	7.7
JAN 14 71	THU	6							
JAN 15 71	FRI	99							
JAN 16 71	SAT	99							
JAN 17 71	SUN	6							
JAN 18 71	MON	6	7.4	7.4	7.3	7.3	7.2	7.5	7.6
JAN 19 71	TUE	6							
JAN 20 71	WED	6	7.5	7.7	7.7	7.8	7.7	7.4	7.4
JAN 21 71	THU	6							
JAN 22 71	FRI	99							
JAN 23 71	SAT	99							

Date of Obsv	Day of Week	Samp Type	Inf PH	P-1 PH	F-1 PH	S-1 PH	P-2 PH	F-2 PH	S-2 PH
JAN 24 71	SUN	6							
JAN 25 71	MON	6	7.7	7.7	7.5	7.7	7.7	7.7	7.7
JAN 26 71	TUE	6							
JAN 27 71	WED	6	6.9	7.2	7.3	7.0	7.3	7.0	7.1
JAN 28 71	THU	6							
JAN 29 71	FRI	99							
JAN 30 71	SAT	99							
JAN 31 71	SUN	99							
FEB 1 71	MON	6	6.9	7.1	6.9	6.9	6.9	7.0	6.9
FEB 2 71	TUE	6							
FEB 3 71	WED	6	7.2	7.2	7.1	7.1	7.1	7.1	7.0
FEB 4 71	THU	6							
FEB 5 71	FRI	99							
FEB 6 71	SAT	99							
FEB 7 71	SUN	6							
FEB 8 71	MON	6	6.9	6.9	6.9	7.0	7.0	7.0	6.9
FEB 9 71	TUE	6							
FEB 10 71	WED	6	7.0	7.1	7.1	7.1	7.0	7.1	7.1
FEB 11 71	THU	6							
FEB 12 71	FRI	99							
FEB 13 71	SAT	99							
FEB 14 71	SUN	6							
FEB 15 71	MON	6	7.1	6.9	6.9	7.0	6.9	7.1	6.9
FEB 16 71	TUE	6							
FEB 17 71	WED	6	7.2	7.0	7.1	7.1	7.1	7.2	7.1
FEB 18 71	THU	6							
FEB 19 71	FRI	99							
FEB 20 71	SAT	99							
FEB 21 71	SUN	6							
FEB 22 71	MON	6	6.7	6.8	6.8	7.0	6.8	7.0	6.9
FEB 23 71	TUE	6							
FEB 24 71	WED	6	6.8	6.8	6.8	6.8	6.7	6.8	6.8
FEB 25 71	THU	6							
FEB 26 71	FRI	99							
FEB 27 71	SAT	99							
FEB 28 71	SUN	6							
MAR 1 71	MON	6	7.0	7.0	7.0	7.0	7.0	7.0	7.0
MAR 2 71	TUE	6							
MAR 3 71	WED	6							
MAR 4 71	THU	6							
MAR 5 71	FRI	99							
MAR 6 71	SAT	99							
MAR 7 71	SUN	6							
MAR 8 71	MON	6	7.1	7.3	7.3	7.2	7.4	7.0	7.0
MAR 9 71	TUE	6							
MAR 10 71	WED	6							
MAR 11 71	THU	6							
MAR 12 71	FRI	99							
MAR 13 71	SAT	99							
MAR 14 71	SUN	6							
MAR 15 71	MON	6	6.9	6.9	6.9	6.9	6.9	6.9	7.0
MAR 16 71	TUE	6	6.7						
MAR 17 71	WED	6	7.2	7.4	7.4	7.5	7.5	7.4	7.5

Date of Obsv	Day of Week	Samp Type	Inf PH	P-1 PH	F-1 PH	S-1 PH	P-2 PH	F-2 PH	S-2 PH
MAR 18 71	THU	6	8.4						
MAR 19 71	FRI	99							
MAR 20 71	SAT	99							
MAR 21 71	SUN	6	7.4	7.4	7.5	7.5	7.4	7.5	7.5
MAR 22 71	MON	6	7.0	7.1	7.2	7.2	7.2	7.2	7.2
MAR 23 71	TUE	6							
MAR 24 71	WED	6							
MAR 25 71	THU	6							
MAR 26 71	FRI	99							
MAR 27 71	SAT	99							
MAR 28 71	SUN	6							
MAR 29 71	MON	6	6.8	6.9	6.9	6.9	6.8	6.9	6.9
MAR 30 71	TUE	6							
MAR 31 71	WED	6	6.9	7.0	7.0	7.0	7.0	7.0	7.0
APR 1 71	THU	6							
APR 2 71	FRI	99							
APR 3 71	SAT	99							
APR 4 71	SUN	6							
APR 5 71	MON	6	6.9	7.3	7.3	7.3	7.3	7.3	7.4
APR 6 71	TUE	6							
APR 7 71	WED	6							
APR 8 71	THU	6							
APR 9 71	FRI	99							
APR 10 71	SAT	99							
APR 11 71	SUN	99							
APR 12 71	MON	6	7.2	7.2	7.2	7.2	7.3	7.3	7.3
APR 13 71	TUE	6							
APR 14 71	WED	6	7.1	7.2	7.2	7.3	7.2	7.2	7.2
APR 15 71	THU	6							
APR 16 71	FRI	99							
APR 17 71	SAT	99							
APR 18 71	SUN	6							
APR 19 71	MON	6	7.2	7.3	7.3	7.3	7.3	7.3	7.4
APR 20 71	TUE	6							
APR 21 71	WED	6	7.0	7.1	7.1	7.1	7.2	7.1	7.1
APR 22 71	THU	6							
APR 23 71	FRI	99							
APR 24 71	SAT	99							
APR 25 71	SUN	6							
APR 26 71	MON	6	7.3	7.3	7.3	7.3	7.3	7.3	7.3
APR 27 71	TUE	6							
APR 28 71	WED	6	7.2	7.2	7.3	7.3	7.2	7.3	7.2
APR 29 71	THU	6							
APR 30 71	FRI	99							
MAY 1 71	SAT	99							
MAY 2 71	SUN	6							
MAY 3 71	MON	6	7.2	7.5	7.4	7.3	7.4	7.3	7.4
MAY 4 71	TUE	6							
MAY 5 71	WED	99							
MAY 6 71	THU	6							
MAY 7 71	FRI	99							
MAY 8 71	SAT	99							
MAY 9 71	SUN	6							

Date of Obsv			Day of Week	Samp Type	Inf PH	P-1 PH	F-1 PH	S-1 PH	P-2 PH	F-2 PH	S-2 PH
MAY	10	71	MON	99							
MAY	11	71	TUE	99							
MAY	12	71	WED	99							
MAY	13	71	THU	99							
MAY	14	71	FRI	99							
MAY	15	71	SAT	99							
MAY	16	71	SUN	6							
MAY	17	71	MON	6	7.1	7.2	7.1	7.3	7.2	7.2	7.1
MAY	18	71	TUE	6							
MAY	19	71	WED	99							
MAY	20	71	THU	6							
MAY	21	71	FRI	99							
MAY	22	71	SAT	99							
MAY	23	71	SUN	6							
MAY	24	71	MON	6							
MAY	25	71	TUE	6							
MAY	26	71	WED	6							
MAY	27	71	THU	6							
MAY	28	71	FRI	99							
MAY	29	71	SAT	99							
MAY	30	71	SUN	99							
MAY	31	71	MON	6							
JUN	1	71	TUE	6							
JUN	2	71	WED	6							
JUN	3	71	THU	6							
JUN	4	71	FRI	99							
JUN	5	71	SAT	99							
JUN	6	71	SUN	6							
JUN	7	71	MON	6							
JUN	8	71	TUE	6							
JUN	9	71	WED	6							
JUN	10	71	THU	6							
JUN	11	71	FRI	99							
JUN	12	71	SAT	99							
JUN	13	71	SUN	6							
JUN	14	71	MON	6							
JUN	15	71	TUE	6							
JUN	16	71	WED	6							
JUN	17	71	THU	99							
JUN	18	71	FRI	99							
JUN	19	71	SAT	99							
JUN	20	71	SUN	99							
JUN	21	71	MON	99							
JUN	22	71	TUE	6							
JUN	23	71	WED	99							
JUN	24	71	THU	6							
JUN	25	71	FRI	99							
JUN	26	71	SAT	6							
JUN	27	71	SUN	99							
JUN	28	71	MON	6							
JUN	29	71	TUE	6							
[illegible]	[illegible]	71	WED	6							
JUL	1	71	THU	6							

Date of Obsv			Day of Week	Samp Type	Inf PH	P-1 PH	F-1 PH	S-1 PH	P-2 PH	F-2 PH	S-2 PH
---	--	--	---	--	--.-	--.-	--.-	--.-	--.-	--.-	--.-
JUL	2	71	FRI	99							
JUL	3	71	SAT	99							
JUL	4	71	SUN	99							
JUL	5	71	MON	6							
JUL	6	71	TUE	6							
JUL	7	71	WED	6							
JUL	8	71	THU	6							
JUL	9	71	FRI	99							
JUL	10	71	SAT	6							
JUL	11	71	SUN	99							
JUL	12	71	MON	6							
JUL	13	71	TUE	6							
JUL	14	71	WED	6							
JUL	15	71	THU	6							
JUL	16	71	FRI	99							
JUL	17	71	SAT	6							
JUL	18	71	SUN	99							
JUL	19	71	MON	6							
JUL	20	71	TUE	6							
JUL	21	71	WED	6							
JUL	22	71	THU	6							
JUL	23	71	FRI	99							
JUL	24	71	SAT	6							
JUL	25	71	SUN	99							
JUL	26	71	MON	6							
JUL	27	71	TUE	6							
JUL	28	71	WED	6							
JUL	29	71	THU	6							
JUL	30	71	FRI	99							
JUL	31	71	SAT	99							
AUG	1	71	SUN	99							
AUG	2	71	MON	6							
AUG	3	71	TUE	6							
AUG	4	71	WED	6							
AUG	5	71	THU	6							
AUG	6	71	FRI	99							
AUG	7	71	SAT	99							
AUG	8	71	SUN	99							
AUG	9	71	MON	6							
AUG	10	71	TUE	6							
AUG	11	71	WED	6							
AUG	12	71	THU	6							
AUG	13	71	FRI	99							
AUG	14	71	SAT	6							
AUG	15	71	SUN	99							
AUG	16	71	MON	6							
AUG	17	71	TUE	6							
AUG	18	71	WED	6							
AUG	19	71	THU	6							
AUG	20	71	FRI	99							
AUG	21	71	SAT	6							
AUG	22	71	SUN	99							
AUG	23	71	MON	6							

Date of Obsv	Day of Week	Samp Type	Inf PH	P-1 PH	F-1 PH	S-1 PH	P-2 PH	F-2 PH	S-2 PH
AUG 24 71	TUE	6							
AUG 25 71	WED	6							
AUG 26 71	THU	6							
AUG 27 71	FRI	99							
AUG 28 71	SAT	6							
AUG 29 71	SUN	99							
AUG 30 71	MON	6							
AUG 31 71	TUE	6							
SEP 1 71	WED	6							
SEP 2 71	THU	6							
SEP 3 71	FRI	99							
SEP 4 71	SAT	99							
SEP 5 71	SUN	99							
SEP 6 71	MON	99							
SEP 7 71	TUE	6							
SEP 8 71	WED	6							
SEP 9 71	THU	6							
SEP 10 71	FRI	99							
SEP 11 71	SAT	6							
SEP 12 71	SUN	99							
SEP 13 71	MON	6							
SEP 14 71	TUE	99							
SEP 15 71	WED	6							
SEP 16 71	THU	6							
SEP 17 71	FRI	99							
SEP 18 71	SAT	6							
SEP 19 71	SUN	99							
SEP 20 71	MON	6							
SEP 21 71	TUE	6							
SEP 22 71	WED	6							
SEP 23 71	THU	6							
SEP 24 71	FRI	99							
SEP 25 71	SAT	6							
SEP 26 71	SUN	99							
SEP 27 71	MON	6							
SEP 28 71	TUE	99							
SEP 29 71	WED	99							
SEP 30 71	THU	6							
OCT 1 71	FRI	99							
OCT 2 71	SAT	6							
OCT 3 71	SUN	99							
OCT 4 71	MON	6							
OCT 5 71	TUE	6							
OCT 6 71	WED	6							
OCT 7 71	THU	99							
OCT 8 71	FRI	99							
OCT 9 71	SAT	99							
OCT 10 71	SUN	6							
OCT 11 71	MON	6							
OCT 12 71	TUE	6							
OCT 13 71	WED	6							
OCT 14 71	THU	6							
OCT 15 71	FRI	99							

Date of Obsv			Day of Week	Samp Type	Inf PH	P-1 PH	F-1 PH	S-1 PH	P-2 PH	F-2 PH	S-2 PH
---	--	--	---	--	--.-	--.-	--.-	--.-	--.-	--.-	--.-
OCT	16	71	SAT	6							
OCT	17	71	SUN	99							
OCT	18	71	MON	6							
OCT	19	71	TUE	6							
OCT	20	71	WED	6							
OCT	21	71	THU	6							
OCT	22	71	FRI	99							
OCT	23	71	SAT	6							
OCT	24	71	SUN	99							
OCT	25	71	MON	99							
OCT	26	71	TUE	99							
OCT	27	71	WED	99							
OCT	28	71	THU	99							
OCT	29	71	FRI	99							
OCT	30	71	SAT	99							
OCT	31	71	SUN	99							
NOV	1	71	MON	6							
NOV	2	71	TUE	6							
NOV	3	71	WED	6							
NOV	4	71	THU	99							
NOV	5	71	FRI	99							
NOV	6	71	SAT	99							
NOV	7	71	SUN	99							
NOV	8	71	MON	99							
NOV	9	71	TUE	99							
NOV	10	71	WED	6							
NOV	11	71	THU	6							
NOV	12	71	FRI	99							
NOV	13	71	SAT	6							
NOV	14	71	SUN	99							
NOV	15	71	MON	6							
NOV	16	71	TUE	6							
NOV	17	71	WED	6							
NOV	18	71	THU	6							
NOV	19	71	FRI	99							
NOV	20	71	SAT	6							
NOV	21	71	SUN	99							
NOV	22	71	MON	6							
NOV	23	71	TUE	6							
NOV	24	71	WED	99							
NOV	25	71	THU	99							
NOV	26	71	FRI	99							
NOV	27	71	SAT	6							
NOV	28	71	SUN	99							
NOV	29	71	MON	6							
NOV	30	71	TUE	15							
DEC	1	71	WED	15							
DEC	2	71	THU	15							
DEC	3	71	FRI	99							
DEC	4	71	SAT	15							
DEC	5	71	SUN	99							
DEC	6	71	MON	15							
DEC	7	71	TUE	15							

Date of Obsv	Day of Week	Samp Type	Inf PH	P-1 PH	F-1 PH	S-1 PH	P-2 PH	F-2 PH	S-2 PH
DEC 8 71	WED	15							
DEC 9 71	THU	15							
DEC 10 71	FRI	99							
DEC 11 71	SAT	15							
DEC 12 71	SUN	99							
DEC 13 71	MON	15							
DEC 14 71	TUE	15							
DEC 15 71	WED	15							
DEC 17 71	FRI	99							
DEC 18 71	SAT	15							
DEC 19 71	SUN	99							
DEC 20 71	MON	15							
DEC 21 71	TUE	99							
DEC 22 71	WED	99							
DEC 23 71	THU	99							
DEC 24 71	FRI	99							
DEC 25 71	SAT	99							
DEC 26 71	SUN	99							
DEC 27 71	MON	99							
DEC 28 71	TUE	15							
DEC 29 71	WED	15							
DEC 30 71	THU	15							
DEC 31 71	FRI	99							
JAN 1 72	SAT	99							
JAN 2 72	SUN	99							
JAN 3 72	MON	15							
JAN 4 72	TUE	15							
JAN 5 72	WED	15							
JAN 6 72	THU	15							
JAN 7 72	FRI	99							
JAN 8 72	SAT	15							
JAN 9 72	SUN	99							
JAN 10 72	MON	15							
JAN 11 72	TUE	15							
JAN 12 72	WED	15							
JAN 13 72	THU	99							
JAN 14 72	FRI	99							
JAN 15 72	SAT	15							
JAN 16 72	SUN	99							
JAN 17 72	MON	15							
JAN 18 72	TUE	15							
JAN 19 72	WED	15							
JAN 20 72	THU	15							
JAN 21 72	FRI	99							
JAN 22 72	SAT	15							
JAN 23 72	SUN	99							
JAN 24 72	MON	15							

APPENDIX B

ABSTRACTS OF PUBLICATIONS RESULTING FROM PROJECT

VARIATIONS IN CHARACTERISTICS OF WASTEWATER INFLUENT AT THE MASON FARM WASTEWATER TREATMENT PLANT, CHAPEL HILL, NORTH CAROLINA.

University of North Carolina, Chapel Hill, Wastewater Research Center.

Robert L. Hanson, William C. Walker, and James C. Brown.
Wastewater Research Center Report No. 13, December, 1970. 47 pp. EPA-WQO Contract No. 14-12-505.

Variations in characteristics of wastewater from the Town of Chapel Hill (N. C.) were studied. Composite samples of domestic wastewater influent were collected at 2-hr intervals over 24-hr periods on each of the seven days of the week so that diurnal variations in flow and constituent concentrations and loadings could be observed. Samples were analyzed for BOD, COD, TOC, nitrogen, phosphorus, MBAS, and specific solids and metal constituents. Influent flow was found to vary from 30 to 144 % of average with the maximum flow occurring between 1000-1200 hours and the minimum flow between 0400-0600 hours. Wastewater constituents showed a wide range of concentrations and loadings. Generally maximum concentrations and loadings occurred between 1000-1400 hours and the minimum values between 0600-0800 hours. The ratio of maximum to minimum concentrations for the constituents varied from 4-12 to one; for loadings, from 10-20 to one.

NITRIFICATION AND DENITRIFICATION - A SELECTED BIBLIOGRAPHY.

University of North Carolina, Chapel Hill, Wastewater Research Center.

Ronald C. Sims and Linda W. Little.
Wastewater Research Center Report No. 14, February, 1971. 19 pp. EPA-WQO Contract No. 14-12-505.

Descriptors: *Bibliographies, *Water pollution sources, *Water pollution effects, *Water pollution control, *Nitrogen, Soils, Effluents, Sewage treatment.

This report comprises a selected bibliography on nitrification, and denitrification pertinent to the microbiological processes involved; transformations of nitrogen in water, wastewater, and soil; sources of nitrogen in water and wastewater; and methods for removing nitrogen from wastewater.

ACTIVATED SLUDGE MODIFICATIONS FOR ENHANCEMENT OF TRICKLING FILTER PLANT PERFORMANCE. I. Design, Operation, and BOD Removal in the Units. II. Nitrification.

University of North Carolina, Chapel Hill, Wastewater Research Center.

Donald E. Francisco, Linda W. Little, and James C. Lamb III.
Wastewater Research Center Report No. 15, April, 1971. 43 pp. EPA-WQO Contract No. 14-12-505.

Presented at the 20th Annual Southern Water Resources and Pollution Control Conference, Chapel Hill, North Carolina, April 2, 1971.

Enhancement of trickling filter plant performance by subsequent activated sludge treatment was investigated. Five activated sludge pilot plants, each consisting of aeration tank and settling tank with air lift sludge return, were fed trickling filter effluent at a constant rate (300 mℓ/min).

Hydraulic detention times in the aeration units were 0.4, 1.7, 4.0 and 9.2 hrs. Temperature was maintained at 25°C. Effects of pH control, sludge wasting, and detention time were evaluated. Results indicated that activated sludge treatment substantially increased overall BOD, COD, organic carbon, and MBAS removals. At detention times of at least 1 hr significant nitrification was achieved. Control of pH with $NaHCO_3$ improved nitrification efficiency; however, substantial nitrification was achieved at pH levels below 7. Control of wasting and of return sludge was necessary for optimum BOD, COD, and organic carbon removals and for optimum nitrification.

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SELECTED WATER RESOURCES ABSTRACTS

INPUT TRANSACTION FORM

1. Report No.

W

4. Title **METHODS FOR IMPROVEMENT OF TRICKLING FILTER PLANT PERFORMANCE. PART I.** MECHANICAL AND BIOLOGICAL OPTIMA

5. Report Date

6.

8. Performing Organization Report No.

7. Author

James C. Brown, Linda W. Little, Donald E. Francisco, and James C. Lamb

11010 DGA

9. Organization

UNC Wastewater Research Center
University of North Carolina
Chapel Hill, North Carolina 27514

14-12-505

13. Type of Report and Period Covered

12. Sponsoring Organization **U.S. Environmental Protection Agency**

Supplementary Notes

Environmental Protection Agency report number, EPA-670/2-73-047a, August 1973.

16. Abstract The Chapel Hill high rate trickling filter plant which consists of two parallel and equal lines of treatment units was operated in parallel as two separate plants over a period of 26 months. Each side was operated with various fractions of influent flow and recirculation flow rates. Statistical analysis of operating results indicated that the common mathematical models are not reliable in predicting daily performance at the Chapel Hill plant. They are, however, useful in predicting long term average performance. Recirculation ratios as high as 3.0 proved beneficial at total hydraulic loadings of less than 20 mgad. Operation above this loading is not currently feasible at Chapel Hill.

The hydraulic surface loading of the final settling tanks was found to have a significant effect on overall plant performance. A surface loading of 500 gpd/ft^2 is recommended for the design of final tanks in new plants.

Pilot plant studies using 4-foot diameter rock filters indicate a significant advantage for two-stage filtration even though the hydraulic loading on each stage may be double that for single-stage operation.

Pilot plant studies of activated sludge treatment of trickling filter effluents were conducted. The process proved effective in improving removal of BOD, if effective final solids removal facilities are provided. The process also proved effective in reducing nitrogenous oxygen demand.

17a. Descriptors

17b. Identifiers

17c. COWRR Field & Group

18. Availability

19. Security Class. (Report)

20. Security Class. (Page)

21. No. of Pages 235

22. Price

Send To:

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