RALPH J. STEPHENSON, P.E.
CONSULTING ENGINEER

January 15, 1975

Subject: Monitoring Report #1

Metropolitan Waste Water Treatment Plant

Owner Contracts 71:06 and 71:07

St. Paul, Minnesota

Kraus-Anderson - General Contractor

Project: 75:3

Dates of Monitoring: January 8 and 9, 1975 (working days 5 and 6)

Target Completion Date: October 1977 for operational completion

Actions taken:

- Reviewed project progress with Mr. Gene Simpkins and Mr. Dave Thies
- Participated in construction meeting re network plan
- Reviewed major project work plans with Mr. Simpkins and Mr. Thies

General Summary

In work to date I have had the opportunity to review the two projects 71:06 and 71:07 in detail with Mr. Simpkins, Mr. Thies and their mechanical and electrical subcontractors. The early project problems are those common to waste treatment plants with special attention being essential to expedite delivery of early built-in items. This includes such items as thimbles, inserts, sleeves and all types of fastenings cast with the concrete. Mr. Simpkins and Mr. Thies are well aware of the majority of these and they were pinpointed again as we reviewed the flow of sewage through the plant in our discussion of the plant operation and construction sequence. I strongly urge that a detailed, comprehensive and up-to-date evaluation of all built-in items be made continually to avoid encountering unexpected long lead time delays and unnecessary and expensive boxouts.

Also of special concern are such difficult delivery elements as motor control centers, special metering devices, pipe hangers and special alloy sleeves and pipe.

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On Wednesday morning, January 8, 1975, I participated in a construction conference mainly to discuss network planning for the job. At this conference Mr. Thies and Mr. Simpkins presented a diagram drawing along with the computer run for 71:07. This was the first issue and was for review by the owner and his consultants. The issue was accompanied by a transmittal. As a note here, I strongly recommend that every item of information that is issued for review, approval, information or whatever other purpose, be accompanied by a transmittal. There appears to be a desire by the job staff to be formal about accepting material for official issue. Therefore, whenever anything is turned over to the owner and his consultants, a proper transmittal should accompany the material.

Several items were covered during our various two day discussions and I have commented on these below at random.

1 - It is difficult to handle the long network sheets as presently prepared for each job. After some discussion it was agreed that Kraus Anderson would present their networks on 24" x 36" sheets. These sheets should contain a title block that has a full set of data including the issue date and number, along with whatever supplementary information is required to identify the sheet content and tie it to the computer run appropriate to that particular issue.

2 - We had some discussion about computer techniques and it appears presently the consultant for the owner is willing to review the present method of preparing the computer output without necessarily accepting it fully at this point. I believe that the owner is willing to be convinced by Kraus Anderson performance that the present format is usable. Therefore, I suggest that every effort be made to get the network format in the owner's and the consultant's hands for approval. A provision of the specification (page 4) is that the format will be approved at an early point. It has been presumed that if the networks as submitted are accepted, it implies approval of the technique being used. This matter should be checked as to whether acceptance implies method approval.

3 - The pay periods on the job and the amounts to be paid are determined by the pay estimate form which was submitted as a part of the contractural documents.

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3 - (continued)

There is a need, according to the owner and their consultants, to assign costs to each task in the network. It will be necessary that the total of all costs on tasks in the network agrees with the total on the pay estimate. At this time there appears to be no unreasonable demands for further subtotal correlation. Mr. Simpkins is presently checking this matter and he and Mr. Thies will prepare the assignment of costs to the best of their abilities in conjunction with each other. Both recognize there must be a reasonable relation between the task costs and the pay estimate. Any cost on a given task should be able to be explained in terms of what it contains relative to the pay estimate.

4 - There was considerable discussion at the construction meeting about failure of the contractor to meet his previous promises relative to issue of networks. However, all parties present considered that that was history, that the job is now moving relatively well in the field and therefore, we should establish a fresh set of due dates for network issues.

It was decided that by February 3, 1975 (working day 23) Kraus Anderson would have in the owner's hands the full network diagram for 71:07 with resources assigned, logic shown and durations assigned for most mechanical and electrical and all architectural and structural, with the further qualification that the electrical and mechanical would be subject to additional review for reissue on March 17, 1975 (working day 53). The later issue on the March 17th date is to insure that current data about mechanical/electrical commitments could be incorporated into the network at that time. It is recognized by the owner and by his consultants that some of the mechanical and electrical work is still indeterminate so far as delivery and installation times are concerned.

So far as 71:06 is concerned, it was agreed that on February 3, 1975 (working day 23) the architectural and structural work with resources assigned would be submitted complete and that the logic and durations

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4 - (continued)

as presently known for the mechanical and electrical would be submitted along with these. However the total mechanical and electrical network with all resources assigned is not due until March 17, 1975 (working day 53). There will be an effort made to get some resources assigned to the electrical and mechanical network for the February 3rd issue.

Mr. Thies and Mr. Simpkins are now preparing confirming letters and will have them in the owner's hands by Monday, January 13, 1975 (working day 8). This should allow feedback from the owner if any of the statements are subject to correction.

It should be noted here that the insistence on meeting these issue dates was high. I believe they are important commitments in terms of maintaining satisfactory client relations, particularly financial on the job.

5 - The request for payment for December through December 20, 1974 was approved, subject to some modification. The owner and the consultants agreed that payment for in-place work in full, minus withheld amounts and some mobilization costs should be met. This was an important informal policy statement by the owner and reflects, in my opinion, a desire by him to cooperate.

6 - There was general agreement that the function of the owner's consultant is to assist in getting the network system in operation and working. The offer was made by the owner and by the consultants to provide any assistance that would be needed to accomplish the work. Where truly needed, advantage should be taken of this offer.

7 - The 71:06 accelerated construction program was discussed at some length and the owner expressed dissatisfaction with the way the project had gone. However, there was a recognition by the owner that the indeterminate nature of the hard substrata and the inability to predict behavior of piling driven to and through that substrata was a major cause for some of the problems that had been encountered.

7 - (continued)

This matter, in my opinion, was discussed appropriately with technically correct language. I feel if it is not brought up too often and rehashed too many times that probably it will resolve itself into the dim history of the job.

On Thursday, P. M., January 9, 1975 I met with Mr. Simpkins and Mr. Thies to review several items including the following.

8 - Mr. Thies showed us the letters he was writing to Mr. Lindsley regarding the networks to be issued on February 3rd and March 17, 1975. The letter appears to be satisfactory. This will be determined by the reaction of the client to the letter.

9 - I reviewed with Mr. Simpkins and Mr. Thies the general monitoring approach I use including initial preparation of rough diagrams; manual computations; color coding of networks based upon observed field progress; evaluation of marked up late start/late finish computer sequences; use of a project schedule status report to identify and isolate by exception those jobs that have not made their late starts and late finishes; and use of a simple payment request form which allows identification of the task by work item number, its cost, a code where appropriate and the percentage of work complete which gives the total cost to date for that particular pay period.

The intent in reviewing these documents was not necessarily to encourage their specific use but to show Mr. Simpkins and Mr. Thies the possibilities inherent in a monitoring program of this type.

I strongly recommend that a straightforward, simple form of monitoring be put into work on the job that gives the principals and manager of the company objective, accurate feedback of job status on a regular basis. We shall discuss this at subsequent meetings.

10 - We talked at length about Kraus Anderson attitudes toward the owner, the owner's consultants, the architect/engineer and the subcontractors. It is

10 - (continued)

important, in my opinion, to maintain excellent human and public relations with the owner since it appears that he and his representatives are pragmatic and interested in building a waste treatment plant rather than engaging in academic management exercise. Therefore, everything that can be pointed toward building the plant and building it well, in my opinion again, will impress the owner with your desire to do the job. The management tools we use for control systems should not dominate the project but remain relatively invisible as guideline tools that allow the job to be run and built properly. The end product is not a plan of work but an actual waste treatment plant.

In essence, I think a firm but polite attitude toward the owner and a listening attitude toward his consultants, along with a quick response in proper form, usually written, to anything this is not, in your opinion, appropriate, is the best method by which you can display your company's attitudes on the project.

I strongly recommend, as the owner has also recommended, that any problems encountered of any nature whatsoever that would tend to delay the project or incur additional costs be made a matter of written record immediately. Such elements as delays to the job by late approvals, shutdowns of project work due to field conditions beyond the contractor's control, items that are held because of interpretations needed for working drawings or others, all should be made a matter of record. This is especially important due to the fact that claims, if they are to be made, must be documented properly. Although this project is not necessarily a claim-prone job in the truest sense of the word, it is entirely possible that it, like most government projects, can become bogged down with paper work. If paper work is not properly handled and kept current, it sometimes becomes cause for claims.

The owner has specifically recommended and I strongly concur that everything that may delay the job or cause problems be documented in timely fashion. If a subcontractor is encountering difficulties with deliveries, or if he cannot obtain certain materials,

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10 - (continued)

or if approvals are not forthcoming on certain items that are needed, then this should be made a matter of record, provided appropriate steps have been exhausted relative to getting them shaken loose. Also, a written daily log such as is now being prepared on the job should be kept to record those items that are unusual or out of the ordinary.

In summary, it appears to me that the current relations on the project are reasonably good and that by working as a team to construct this project rapidly and as well as possible to the plans and specs is the best way of insuring harmony within the project organization.

The network plans that have been committed on February 3rd and March 17th should be produced on those dates and a face to face review period should ensue. It is always best when preparing network plans to involve the major parties who are affected in the actual discussions of sequencing and resource assignment. I tend to believe on this project that a little more of this particular face to face work would be appropriate, particularly with the participation of Mr. Simpkins and Mr. Thies. They are critical men on the job at the present time and should be actively engaged in preparing and obtaining approvals on the network diagrams.

I further suggest sometime subsequent to February 3, 1975 that I review the issued diagrams and perhaps walk through one or two monitoring sessions with the staff of Kraus Anderson. I shall be in touch with Mr. Svee regarding this matter.

Ralph J. Stephenson, P.E.

RJS
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To: Mr. Gene Simpkins
Mr. Dave Thies

Air Mail

RALPH J. STEPHENSON, P.E.
CONSULTING ENGINEER

February 26, 1975

Subject: Monitoring Report #1

Metropolitan Waste Water Treatment Plant

Pre-treatment Facility, St. Paul, Minnesota 7106

Contractor: Kraus-Anderson of Mpls, Inc.

RJS Project: 75:3

Monitored from basic issue #1 dated 3 February 1975

Date of Monitoring: February 20, 1975 (working day 36 - 1975/76 working day calendar)

Contract Completion Dates:

Temp flood protection
Phase 1A - March 1, 1975 (working day 43 from 1975/76 working day calendar)

Perm flood protection
Phase 1B - March 1, 1976 (working day 298) (915)

5 perm divisions
Phase 2 - August 1, 1977 (approx. working day 662)

All work in testing and Cleanup
Phase 3 - October 1, 1977 (approx. working day 704) (957)

Actions taken:

- Inspected project
- Conferred with Mr. Gene Simpkins, project manager and Mr. Dave Thies re current job status
- Reviewed project progress and projected work
- Conferred briefly with owner and owner consultant re network planning system
- Evaluated current job status

Phase 1A

Currently in phase 1A, flood wall construction is almost complete with the exception of a small portion between stations 311 and 351

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which will be built after the diversion pile caps are poured, and a section at the railroad which will be filled in only if flood conditions demand. The basic goal of phase 1A is to complete adequate protection work at the site prior to the normal start of flood season for the Mississippi River. The flood season is currently assumed by the contractor to be from March 1, 1975 (working day 43) through May 1, 1975 (working day 87). It is not usual for the season to last that long but these assumptions are being made for conservative field planning purposes.

The basic issue network dated 3 February 1975 showed installation of the temporary by-pass pipe prior to the start of the flood season. However, because temporary flood sheeting is now being installed, along with the permanent flood wall, this by-pass pipe will not be completed and hooked up until after the flood season. This change in logic will be reflected in the next basic issue of the network diagram.

Reviewing progress of work at the pre-treatment building, piling is currently a projected 31 working days behind the basic Issue #1 network plan. In the original contract documents, it was anticipated that piling at the pump gallery would be driven to limestone bedrock. At that point driving would stop and the pile bearing would be on the limestone bedrock. However, while driving, some piles have not seated at the originally designed elevation and subsequent borings over a large area indicate that the limestone bedrock may actually be tumble rock. Therefore, it is possible that the piling has been driven through the tumble rock. There is presently no indication as to where the bearing surface will be. To further explore the substrata, some piling is now being cast with a pipe core and after this new piling is driven, sounds will be taken to further explore the bearing strata. The lag is due to this delay for further exploration. Piling at the pipe gallery restrains other work at the gallery which also shows up as having a late start lag.

No evaluation was made during this monitoring of shop drawings, fabrication and delivery elements, since accurate information is not available at this time. However, in subsequent monitorings an analysis of the long lead time items, particularly, will be made a regular part of the evaluation. It is known that fabrication of sluice gates and the operators is presently planned to begin at the plant in March.

In summary, phase 1A work related to temporary flood protection is presently meeting target dates and should be completed in time

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for the start of flood season on March 1, 1975 (working day 43).

Phase 1B is generally meeting target dates except that a section of the flood wall between 311 and 351 will be left out until construction of the diversion pile caps.

Phase 2 work, primarily piling at the pump gallery, lags by about 31 working days projected due to difficulties in driving the piling to proper bearing. This matter is now being studied as discussed above.

Ralph J. Stephenson, P.E.

RJS
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To: Mr. Gene Simpkins, Project Manager
Mr. Dave Thies, Estimator and Scheduler
Mr. Jerry Svee, Executive Vice Pres. & General Mgr.

T.F.

• CRITICAL PATH PLANNING

• LAND PLANNING

• MANAGEMENT CONSULTING

• PLANT LOCATION

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15064 WARWICK ROAD
DETROIT, MICHIGAN 48223
PHONE 273-5026

February 25, 1975

Mr. Jerry Svee
Mr. Gene Simpkins
Mr. Dave Thies
Kraus Anderson of Mpls, Inc.
525 South 8th Street
Minneapolis, Minnesota 55404

On February 20, 1975 Dave Thies, Gene Simpkins and I met at the job site to begin monitoring the project and to inspect work progress. Following our tour of the job, I participated in a meeting at the owner's office with Mr. Foster, Mr. Campbell, Mr. Wymore, Mr. Simpkins and Mr. Thies. At this meeting we discussed in detail the various elements of the network system and how they were to be issued, along with the basic participation expected of BSC in its preparation. A review of the material covered at the meeting is given below, at random.

- It was restated that Kraus Anderson would be expected to issue the major networks for 7106 and 7107 on March 17, 1975. These networks are to be run using the PCS360 program. The following data is to be generated:
  - Work item sequence
  - Early start sequence
  - Late start sequence
  - Start float sequence
  - Estimated value of work in place by month for early starts and late finishes (no cash curve need be plotted)
  - Work status and progress monthly report
  - Lump sum cost report monthly
- Mr. Campbell of BSC requested that if any critical end time restraints imposed by the S5 feature of the PCS program are put into the diagram that they be identified and stated.

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- We outlined two basic definitions. These are for monitoring and updating. The definitions as agreed upon are as follows:

  Monitoring - Inspecting the project and measuring it against the basic issue diagram used as a standard of expected performance.

  Updating - All monthly reporting documents reflecting current job progress and status.

  Any minor logic changes on the monthly issue need only be narrated and accompany the monthly submissions.

  Updating also includes any major revision to the logic or resource assignment which requires issuing a new basic network.

  It would be wise to review these definitions with the owner and his consultant to insure that they are satisfactory to them.

- BCS will designate their major milestones for interfacing with other project networks subsequent to the March 17, 1975 issue by Kraus Anderson.

- As part of our discussion we went through the procedure to be followed from here out to the issue of the basic diagrams on March 17, 1975. This procedure is outlined as follows:

  A. Mr. Thies will confer with his draftsman and set a format for graphic presentation of network logic.

  B. Approximately two sheets will be drafted in final form after which they will be reviewed with BSC and the owner's representative, Mr. Foster, for adherence to proper and acceptable form. It is expected that this review will take place on the A.M. of February 26, 1975 or earlier. The meeting should cover sheet arrangement, work item numbering and general data display expected on the logic plan.

  C. Kraus Anderson will next proceed to prepare the final drafted diagram taking into account the conference with the owner and BSC.

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D. When one project, probably 7106, is drafted in final form and the data properly shown, Kraus Anderson will review the material with BSC and the owner prior to final keypunching. Early keypunching might proceed concurrently with bringing the diagrams into final form.

E. Once the input has been reviewed with the owner, BSC, an initial review run on 7106 will be made.

F. A conference will be held with the owner and BSC to debug the initial review run on 7106.

G. Concurrently with this review Kraus Anderson will make a manual check of the initial review run against the drafted network. This should be a work item by work item comparison of the two documents to insure that the computer run is an accurate statement of the logic plan.

H. Once the initial review run has been debugged and compared against the manual diagram for accuracy, a final run will be made and the networks issued for 7106 and 7107 field use.

J. The issued material will include the basic issue information along with a cost update as of February 17, 1975. (Note: the interfacing dates with BSC and the owner from the above are as follows:

February 26, 1975 - A.M.	-	Confer re initial drafting arrangement
March 3, 1975 or earlier and on an ongoing basis	-	Review the network logic prior to final keypunching
March 7, 1975	-	Work with Kraus Anderson to debug initial run)

- It has been requested by the owner's consultant that I sign the final issue documents or state my agreement that they appear to offer and represent a feasible plan of action, and that th the best of my current information and knowledge have been processed properly. I shall review this matter and determine the appropriateness of it for this basic issue. In light of this matter I have asked

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Mr. Thies to provide me with copies of whatever material is reviewed with the owner, BSC, along with as much current information as can possibly be sent to me on a continuing basis. This will allow me to make the reviews required in a timely fashion.

After the meeting at the job site, Mr. Thies and I returned to the office and worked on the network diagram to isolate and identify the problem areas and set the format for final issue. The following random points apply to our afternoon discussion:

- We met with Mr. Mike Fowler, the engineer, who will be drafting the network into final form. It was decided that Mr. Fowler will work on this personally in arranging the sheets and that the drafting will take into account identification on each work item of the task description, the work item number, the duration, the specification number, the area code (geographic location of work) and leaving space for the dollar amounts to be inserted as required.

  I suggested that Mr. Fowler prepare the graphics so that early and late starts and finishes can be inserted at the beginning of each work item and at the end of each work item on the outside of the box.

- It was agreed that on the cover sheet or on some other early sheet in the diagram the following information would be listed:

  - A narrative identification of areas 1 through 5 (see below for these areas)

  - A full abbreviation list

  - A general note area

  - A key for the work item box information

  - A space to record the issue number - this space should provide for the basic issue number and also for the monthly updating issue number.

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- A monitoring record space

- A description of the color codes to be used, if applicable. (This does not have to be shown for the March 17th issue.)

- It was agreed that arrowheads should appear on all restraint relations.

- When drafted in final form, all preceding and succeeding work items on all remote connections will be shown.

- A sample program will be run using the PCS program and based upon some relatively small project currently completed so far as diagramming is concerned in the office. Mr. Thies will select a project to be tested with the PCS program.

- When the final 7106 and 7107 run is prepared, Mr. Thies has agreed to prepare a late finish sequence for monitoring use. This does not have to be issued to the owner and his consultant.

- It was agreed that project 7106 and 7107 will be run separately and issued separately. This was agreed to in the morning meeting with the owner and his consultant.

- In a phone conversation with Mr. Campbell of BSC late in the afternoon of February 20, 1975, it was agreed by him that we could keep the major mechanical and electrical work sequence separate from the architectural and structural work sequences in our final diagrams. However, every effort should be made to put these trade diagrams somewhere near each other. This will be worked out as a drafting matter by Mr. Thies with Mr. Fowler.

- I recommend that the completed network diagram as drafted by Mr. Fowler be manually computed, using working day calculations. Further, I suggest that the computer run work item sequence be used as a spot check against the manual computations on early starts and early finishes only. The technique of doing this has been discussed with Mr. Thies and he is aware of the

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methodology. This allows errors in the computer run relative to the logic plan to be isolated, bracketed and identified more easily. Final item by item checking is critical. The lack of time available for such critical checks prior to the issue of the first basic diagram has strongly contributed to the problems that we are encountering in correcting the basic issue.

- The areas as designated in the 7106 contract 1 through 5 have been defined by us as follows:

  - Area 1 is the area outside and to the west and south of the pre-treatment building including the force main and vault areas.

  - Area 2 is the pre-treatment building from the pump gallery up through the first floor line.

  - Area 3 is the pre-treatment building from the first floor line through the roof.

  - Area 4 is the grit tanks and effluent channel.

  - Area 5 is all work east of the effluent channel to the project boundary.

Ralph J. Stephenson, P.E.

RJS
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March 17, 1975

Subject: Monitoring Report #3

Metropolitan Waste Water Treatment Plant

Pre-treatment Facility, St. Paul, Minnesota 7106

Contractor: Kraus-Anderson of Mpls, Inc.

RJS Project: 75:3

Monitored from basic Issue #1 dated 3 February 1975

Date of Monitoring: March 12, 1975 (working day 50)

Contract Completion Dates:

Phase 1A	Temporary Flood Protection	March 1, 1975 (working day 43)
Phase 1B	Permanent Flood Protection and Diversion Structure	March 1, 1976 (working day 298)
Phase 2	All remaining work, up to testing out plant	August 1, 1977 (approx. working day 662)
Phase 3	Complete testing and making plant operational	October 1, 1977 (approx. working day 704)

Actions taken:

- Inspected project
- Conferred with Mr. Gene Simpkins, project manager re current job status
- Reviewed current work on basic Issue #2 to be dated March 17, 1975
- Evaluated current job status

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Phase 1A

Phase 1A is substantially complete and the owner has been notified of this by letter. He has not as yet responded by letter but has indicated to Mr. Simpkins verbally that they will accept the completed phase. A letter should follow. Photos have been taken of the completed work and should be made a permanent part of the job photo file.

Phase 1B

The third barrel has been constructed from the north flood wall to station 3 + 51. Some piling has been driven for the diversion structure and it is expected to get work actively underway for Phase 1B, flood conditions permitting, on May 1, 1975 (working day 86). It is expected to construct the diversion structure and then to move on into the remaining Phase 1B work with the new channel to the addition. During this period the flood wall from station 3 + 51 to the south will be completed.

Phase 2

Pile driving at the pump gallery has been substantially halted since the last monitoring (February 20, 1975, working day 36). There still is no resolution of the piling problems, although several concrete piles with pipe centers were driven with the intent of taking soundings once they were in place. However, these piles broke at the 22' level and therefore, could not be used to establish the nature of material in the substrata. Presently there are active discussions being carried out regarding the next move but until this matter is resolved, additional pile driving at the pump gallery will be deferred. Thus, the lag in this work will continue to increase until a resolution of the problem is made.

At the grit tanks, batter piles in several locations appear to be in line with each other. If these are driven in line, they may intersect since the batter on the pile is called for at 6" to 12". This problem is somewhat related to the pile problem at the pump gallery since there is under consideration a change in the piling type. However, it is a separate problem in that it is influencing current work at the grit chamber provided piling types presently projected could be driven. Therefore, it is my recommendation that resolution of the batter pile interference be kept separate from a decision on the pile type to be used at the pump gallery. This whole problem is a complex situation and should be watched carefully with resolution of each element being made on its own merit wherever possible.

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I strongly recommend that all problem areas and all suggested approaches be documented in writing with the owner so that upon resolution of the piling problem, a clear evaluation can be made of the additional time and money expended.

Relative to shop drawings, fabrication and delivery of critical items, there still is not adequate information to make a proper evaluation at this point. However, in conversation with Mr. Simpkins, he said that three valves and the sludge scraper rails are very important to expedite since they are built in items. Most other items in concrete could be boxed out, if necessary. A detailed list of all items to be brought onto the job is being prepared by Mr. Simpkins and Mr. Thies. It will be very important for these shop drawings to be processed in timely fashion by the architect/ engineer.

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In summary, Phase 1A is substantially complete, Phase 1B is currently meeting target dates between early and late starts and finishes and Phase 2 work is currently held by non-resolution of the piling problem at the pump gallery. This matter is presently under study and will be a direct delay to the job until resolved.

Ralph J. Stephenson, P.E.

RJS
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To: Mr. Gene Simpkins, Project Manager
Mr. Dave Thies, Estimator and Scheduler
Mr. Jerry Svee, Executive Vice Pres. & General Mgr.

RALPH J. STEPHENSON, P.E.
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April 21, 1975

Subject: Monitoring Report #4

Metropolitan Waste Water Treatment Plant

Pre-treatment Facility, St. Paul, Minnesota 7106

Contractor: Kraus-Anderson of Mpls, Inc.

RJS Project: 7513

Monitored from basic issue #2 dated March 17, 1975

Date of Monitoring: April 16, 1975 (working day 75)

Contract Completion Dates:

Phase 1A	Temporary Flood Protection	March 1, 1975 (working day 43)
Phase 1B	Permanent Flood Protection and Diversion Structure	March 1, 1976 (working day 298)
Phase 2	All remaining work, up to testing out plant	August 1, 1977 (approx. working day 662)
Phase 3	Complete testing and making plant operational	October 1, 1977 (approx. working day 704)

Actions taken:

- Inspected project
- Conferred with Mr. Gene Simpkins, project manager, Mr. Herb Hanson, superintendent and Mr. Dave Thies re job progress
- Reviewed current work on basic issue #2 date, March 17, 1975
- Evaluated job status

Phase 1A

The owner has responded formally in writing that Phase 1A is accepted. This phase will be dropped from subsequent reports.

Phase 1B

Little work has been done on Phase 1B during the period from March 17, 1975. However, it is expected to begin work actively

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there on May 1, 1975 (working day 86) provided flood conditions permit. The peak flood point presently is anticipated by the Sewer Board to be Monday, April 21, 1975 (working day 78).

Although work is officially committed to begin on May 1, 1975 (working day 86) at the conduit, it is possible that a second driving rig will be brought to that area and work can start as early as the week of April 21, 1975.

Phase 2

At the pump gallery pile driving has again resumed and piles are being driven to point bearing. Piling has been completed in the south third and driving will continue on across the remainder of the pump gallery.

Meanwhile, resteel and equipment is being mobilized to begin constructing the slab on grade at the pump gallery. Presently there is no apparent delay to continuing pile driving at the pump gallery.

At the grit tanks the batter pile interference problem has been resolved providing piling is not driven to a depth of more than 40' below present grade. However, as piling installation moves from west to east, the depth required will be greater. At this point a further evaluation must be made to determine if the batter piles will intersect if driven within the tolerable limits.

* * * * *

Measuring the project against the late start sequence of the basic issue #2 dated March 17, 1975, all major field tasks that should be started as of April 16, 1975 (working day 75) have started. However, there still are some submissions of critical equipment that lag. These include:

- Hose valves
- Plug valves
- Fabricated steel pipe
- Grit tank aeration equipment
- Belt conveyer equipment

Measuring job progress against the late finish dates, we find that all tasks and submittals that were to have been completed by April 16, 1975 (working day 75) have been completed.

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RALPH J. STEPHENSON, P.E.
CONSULTING ENGINEER

In summary, work in Phase 1A is completed and accepted in writing by the owner. Project 1B is expected to start no later than May 1, 1975 and perhaps pile driving can start earlier. Phase 2 has been resumed and all field work is presently meeting current basic issue target late start/late finish dates. Submissions should be given some attention now.

Ralph J. Stephenson, P.E.

RJS/m

To: Mr. Gene Simpkins, Project Manager
Mr. Dave Thies, Estimator and Scheduler
Mr. Jerry Svee, Executive Vice Pres. & Genl. Mgr.
Mr. Herb Hanson, Superintendent
General

RALPH J. STEPHENSON, P.E.
CONSULTING ENGINEER

July 3, 1975

Subject: Monitoring Report #5

Metropolitan Waste Water Treatment Plant

Pre-treatment Facility, St. Paul, Minnesota 7106

Contractor: Kraus-Anderson of Mpls, Inc.

RJS Project: 75:3

Monitored from basic issue #3 dated April 25, 1975

Date of Monitoring: June 25, 1975 (working day 124)

Contract Completion Dates:

Phase 1B	Permanent Flood Protection and Diversion Structure	March 1, 1976 (working day 298)
Phase 2	All remaining work, up to testing out plant	August 1, 1977 (working day 662)
Phase 3	Complete testing and making plant operational	October 1, 1977 (working day 704)

Actions taken:

- Inspected project
- Conferred with Mr. Lyle Meyer, Mr. Myron Mickelsen and Mr. Dave Thies re job progress
- Evaluated job status

Current Strike Status

On May 20, 1975 (working day 99) iron workers went out on strike. June 3, 1975 (working day 108) inside equipment operators at sand and gravel plants went on strike, stopping loading of ready mix concrete trucks and thus, delivery of concrete and aggregate to the site. On June 16, 1975 (working day 117) carpenters and laborers went on strike.

To all intents and purposes, the job was totally stopped the morning of June 16, 1975 (working day 117) by tradesmen picketing. However,

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the project began to slow at the start of the iron workers strike on May 20, 1975 (working day 99) and thus, to all intents and purposes, major lags to current work can be totally, or in part, traced back to that point and possibly a few days before, due to general slowdowns that normally occur prior to major work shutdowns.

Presently there is no indication as to when any of these strikes will be over. However, upon the strike settlements, it can be expected that there will be a startup period of from 5 to 10 working days before full productivity is regained on the job site. Some of this startup time will be occupied in dewatering and cleanup since it has been difficult to keep the site dry and clean during the strike due to lack of tradesmen.

Phase 1B

Work had just begun under this part of the job when the strike began. Piling has been driven for the influent conduit except at the existing railroad and forming has started on the mat of the conduit. The existing west interceptor has been diverted to the east interceptor and final tie-in of the bypass pipe is ready to be made. The strike has caused a dislocation of the early start/early finish targets for Phase 1B and adjustments to the plan of work will be made in the basic issue #4 to be run and distributed subsequent to the strike. The current strike situation will probably delay backfilling at the new influent conduit and possibly cause railroad work there to be delayed into winter weather. This may pose some problems due to backfilling and compacting in cold weather temperatures.

Phase 2

At the pump gallery all piling has been driven and the base mat is poured for the gallery except at the center section. Work at the west service tunnel shows the greatest lag with piling there being completed, but very little of the pile cap area being constructed. The current lag at the gallery over the basic issue #3 network is approximately 28 working days - nearly the total strike lag time.

Overall, work at the pre-treatment structure was in excellent condition prior to the strike.

The force main and influent conduit pile caps were due to be completed on May 16, 1975 (working day 98). There are about eight additional days to complete this work and therefore, the lag is approximately 34 working days. However, it is anticipated that this time can be picked up once work again resumes. Since the area is critical to construction of the relocated track system, I recommend it be given early attention at the end of the strike.

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So far as deliveries are concerned, elements that are presently past their late start dates include:

- fabrication of the rotary positive displacement compressor
- fabrication of grit tank aeration equipment
- delivery of floor and gutter drains and cleanouts.

The rotary positive displacement compressor was due to be delivered at an early date so as to be able to bring it into the structure prior to construction of the cap slab over the compressor room. A method of getting the compressor into the building has now been devised and this restraint is no longer a holdup to its setting.

Shop drawings went in for approval on the grit tank aeration equipment on May 27, 1975 (working day 103) and have not yet been returned. Fabrication of this equipment was due to begin on June 12, 1975 (working day 115) so the fabrication is currently 12 working days late. I strongly suggest a review of this item be made at an early date to determine the current fabrication and delivery time required. The floor and gutter drains, along with the cleanouts, have been boxed out for and although it is an inconvenience, has not been a delay to the field work.

At the grit tanks, piling was proceeding substantially on or slightly ahead of schedule when the strikes occurred.

* * * * * *

Because within a few months much of the general contract management work will revolve around expediting delivery of major mechanical and electrical equipment to the job, I recommend that a periodic (once per month or more frequently) review be made with the major sub-contractors on the job to determine current delivery status for all items shown in the network delivery schedule. This meeting should be based upon a systematic review of each item and its current status as specifically shown in the fab and delivery items on the material and equipment schedule sheets.

In summary, work in both phases 1B and 2, as of the strike on May 20, 1975 (working day 99) was in good condition and major tasks substantially in accordance with the basic issue #3 network. A revised basic issue #4 will be prepared and distributed when the current strikes are over and work again resumes.

Ralph J. Stephenson, P.E.

RJS/m

To: Messrs. Simpkins, Thies, Svee, Hanson

RALPH J. STEPHENSON, P.E.
CONSULTING ENGINEER

December 9, 1975

Subject: Monitoring Report #6

Metropolitan Waste Water Treatment Plant

Pre-treatment facility, St. Paul, Minnesota 7106

Contractor: Kraus-Anderson of Mpls, Inc.

RJS Project: 75:3

Monitored from basic issue #3 dated April 25, 1975

Date of Monitoring: December 4, 1975 (working day 237)

Contract Completion Dates:

Phase 1B	Permanent Flood Protection and Diversion Structure	March 1, 1976 (working day 298)
Phase 2	All remaining work, up to testing out plant	August 1, 1977 (working day 662)
Phase 3	Complete testing and making plant operational	October 1, 1977 (working day 704)

Actions taken:

- Inspected project
- Conferred with Mr. Gene Simpkins and Mr. Dave Thies re job progress
- Evaluated job progress

General Summary

Presently project work is moving very well in all areas with the possible exception of the compressor room. Compressor room walls were due to be completed on December 9, 1975 (working day 240). They presently will be complete within the next two weeks which will give them a lag of 7 to 10 working days. However, it should be kept in mind that the basic issue #3 network did not take into account the long series of summer strikes. Therefore, this lag is a lag over the non-strike network. It is Mr. Thies' intent to prepare an updated network on the 7106 project

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sometime within the next two months which will take strike delays into full account.

Structural steel is due on the job tomorrow, December 5, 1975 (working day 238) which is approximately 6 weeks ahead of the projected start of erection of structural steel. Pre-treatment building concrete work is substantially complete and ready to receive the first tier of steel at the pre-treatment building. However, it is possible that concrete work at the compressor room will delay completion of structural steel and prevent its being completed in a single erection phase.

Phase 1B work was originally due to be complete December 10, 1975 (working day 241). This has been revised to March 1, 1976 (working day 298) as presently called for by contract. The work here is in good condition relative to the March 1, 1976 date.

We also reviewed all major deliveries and currently it appears that most items both short and long lead time are in reasonably good shape. As has been recommended previously, it would be wise to carefully review delivery items on a regular basis.

I strongly suggest at this time that the interface points with other portions of the plant not under this contract be defined to Kraus-Anderson by the owner at an early date. The request for definition should be in the form of a list of questions to the owner about influences upon this plant being operational that are imposed by the owner or by other contractors. This matter is discussed in more detail in monitoring report #6 for project 7107. Comments there apply equally to 7106.

In summary, the project is currently moving very well despite a considerable loss of time this summer due to work stoppages resulting from strikes. I recommend that an updating of the network be accomplished in the near future to reflect revisions to the logic that have become desirable.

Ralph J. Stephenson, P.E.

RJS/m

To: Mr. Gene Simpkins, Project Manager
Mr. Dave Thies, Estimator and Scheduler
Mr. Jerry Svee, Executive Vice President
Mr. Herb Hanson, General Superintendent

RALPH J. STEPHENSON, P.E.
CONSULTING ENGINEER

May 11, 1976

Subject: Monitoring Report #7

Metropolitan Waste Water Treatment Plant

Pre-treatment facility, St. Paul, Minnesota 7106

Contractor: Kraus-Anderson of Mpls, Inc.

RJS Project: 75:3

Monitored from basic issue #5 dated February 6, 1976

Date of Monitoring: May 4, 1976 (working day 343)

Contract Completion Dates:

Phase 1B	Permanent Flood Protection and and Diversion Structure	March 1, 1976 (working day 298)

This phase is now substantially complete.

Phase 2	All remaining work, up to testing out plant	August 1, 1977 (working day 662)
Phase 3	Complete testing and making plant operational	October 1, 1977 (working day 704)

Actions taken:

- Inspected project
- Conferred with Mr. Lyle Meyer and Mr. Dave Thies re job progress (Mr. Simpkins was downtown and Mr. Meyer kindly reviewed the project with us)
- Evaluated job progress

General Summary

Work continues to move well and most major tasks are meeting targets between early and late starts and finishes. There are one or two minor exceptions but it does not appear that they are presently critical to job progress since they were originally shown as crewing task sequences. One of these is installation

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of dewatering piping in the pump gallery and another is installation of grit tank walkway drain pipe. However, neither of these, as pointed out above, is presently critical.

One item of delivery that is proving difficult concerns the flow meters to be installed in the primary effluent meter vaults. These are currently to be in by September 1976, a later date than had been desired. The roof of the vault cannot be installed until the meters are in place and this delays site work due to access needs.

We again reviewed the major interface points for 7106. These basically are:

- 7107 available for services

  (Note: this is basically internal to Kraus-Anderson)

- Permanent power - very critical and must be given a high priority of attention

Field relations on a day to day basis are presently very good and it might be difficult to force early commitments to interfaces without endangering these good technical relationships. However, at some point in time the plant will be done and it is going to be essential long before that time for Kraus-Anderson to know where they stand relative to turning over the project, being paid retainage and settling any time extensions or other problems that may have existed relative to liquidated damages. Therefore, I strongly recommend that the Kraus-Anderson organization review internally at a high level the turn-over and interface needs of the project. This matter is one that will be of increasing importance, more particularly since the project is progressing in excellent fashion and right now it appears there is a chance that work will be substantially complete before our target dates. This matter is also discussed in the current monitoring report for the primary settling tanks, prior 7107.

Ralph J. Stephenson, P.E.

RJS/m

To: Mr. Gene Simpkins, Project Manager
Mr. Dave Thies, Estimator and Scheduler
Mr. Jerry Svee, Executive Vice President
Mr. Herb Hanson, General Superintendent
Mr. S. Craig Moleski, P.E., Vice President

RALPH J. STEPHENSON, P.E.
CONSULTING ENGINEER

August 23, 1976

Subject: Monitoring Report #8

Metropolitan Waste Water Treatment Plant

Pre-treatment facility, St. Paul, Minnesota 7106

Contractor: Kraus-Anderson of Mpls, Inc.

Project: 75:3

Project evaluated from conference with mechanical, electrical and general trades superintendents

Date of Monitoring: August 17, 1976 (working day 416)

Contract Completion Dates:

Phase 1B	Permanent Flood Protection and and Diversion Structure	March 1, 1976 (working day 298)

This phase is now substantially complete.

Phase 2	All remaining work, up to testing out plant	August 1, 1977 (working day 662)
Phase 3	Complete testing and making plant operational	October 1, 1977 (working day 704)

Actions taken:

- Inspected project
- Conferred with Mr. Dave Thies, Mr. Myron Mickelson, Mr. Gene Simpkins, Mr. Bill Nelson, Mr. Duane Slater and Mr. Jack Herman re mechanical, electrical and general work remaining on job
- Evaluated project progress

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CONSULTING ENGINEER

General Summary

Work at the pre-treatment plant continues to move very well with the structure and exterior skin nearly complete. Installation of mechanical piping and equipment is well along, with electrical work following closely.

The major effort at this monitoring was to evaluate the possibility of completing the building at an early date, perhaps about early January 1977, sufficiently to allow a series of clear water tests to be run on the equipment. Considerable discussion ensued at the conference regarding the merits of the clear water test and Mr. Simpkins, along with other executives at Kraus-Anderson will review and evaluate this matter in more depth over the coming weeks.

Advantages of clear water testing may include:

a) The possibility of partial acceptance by the owner and subsequent reduction in retained amounts.

b) An expediting of testing which must be made with actual influent in the plant; thus, hydraulic debugging might be reduced by use of an earlier clear water test.

c) Through reduction in testing time after completion of the plant, obtain an earlier payment of the total retainage.

These three reasons seem to be at present sufficiently important to justify pursuing the matter further.

With the participation of the mechanical and electrical contractors' field managers, we also prepared small summary networks of the mechanical and electrical work remaining. It was quite apparent that the most critical point in the entire network model was the point in time at which the owner will be able to provide permanent power to the site. Presently (by other contract conditions) permanent power should be available from project 7108 - 1, phase 3 by July 1, 1977 (working day 384). This is a very critical date since it is the intent to have both the pre-treatment building and the primary settling tanks (project 7107) complete and ready for full use of permanent power by that date. Of course, if permanent power is made available earlier, it can be used very effectively in the current construction operation.

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In fact, Mr. Duane Slater mentioned that he would be pleased to have permanent power available now to the job. It would be of immense help to have permanent power available for clear water testing.

Another important item of work on the electrical network is delivery, installation and wiring of process control panels (PCP) and their interfaces with primary settling tank work. Presently the process control panel is due on the job about September 20, 1976 (working day 439). Following setting of process control panels, conduit must be installed from the motor control centers, wire pulled, the wire identified and hooked up, field mounted equipment installed, interface tie-ins made to the project 7107, and wire pulled to the field mounted equipment. This work is due to be finished no later than June 29, 1977 (working day 637).

Bar screen equipment will be delivered to the job site starting on September 27, 1976 (working day 444). Completion of all equipment to the job site is scheduled for delivery by November 1, 1976 (working day 469). It is generally the intent to complete installing bar screen equipment by December 30, 1976 (working day 510). As noted above, it is the intent to have the building ready for clear water testing if found feasible by the end of 1976.

To be emphasized is that in order to maintain a clean interface point between the owner's responsibility to provide permanent power to the building and the ability of the building to receive and make effective use of this permanent power that all work which must and can be done prior to provision of permanent power is actually completed. Thus, on July 1, 1977 (working day 384) the project should be complete, waiting for nothing to operate and test but permanent power.

I left copies of the mechanical and electrical summary networks with Mr. Thies and Mr. Simpkins. They will make a further review and analysis of the contents.

Mr. Simpkins has prepared a testing and startup network based upon provisions of the specifications. This is now being reviewed for general use. I suggest that the summary diagrams prepared remain a part of the internal field control documents, rather than being incorporated into the present official network.

Ralph J. Stephenson, P.E.

RJS/m

To: Messrs. Simpkins, Thies, Svee, Hansen, Moleski

RALPH J. STEPHENSON, P.E.
CONSULTING ENGINEER

April 28, 1977

Subject: Monitoring Report #9

Metropolitan Waste Water Treatment Plant

Pre-treatment facility, St. Paul, Minnesota 7106

Contractor: Kraus-Anderson of Mpls, Inc.

Project: 7513

Project evaluated from conference with Mr. Simpkins, Mr. Thies and Mr. Mickelson

Date of monitoring: April 25, 1977 (working day 591)

Contract Completion Dates:

Phase 1B	Permanent Flood Protection and and Diversion Structure	March 1, 1976 (working day 298)

This phase is substantially complete.

Phase 2	All remaining work, up to testing out plant	August 1, 1977 (working day 662)
Phase 3	Complete testing and making plant operational	October 1, 1977 (working day 704)

Actions taken:

- Inspected project
- Conferred with Mr. Dave Thies, Mr. Gene Simpkins and Mr. Myron Mickelson re job progress
- Evaluated job status

General Summary

Work at the pre-treatment building is now about 30 working days from substantial completion. This would bring the present target for completion to June 7, 1977 (working day 621). The major items remaining to be completed include:

- calibration of mag-meters
- possible field testing of mag-meters
- installation of sleeves and thimbles, along with subsequent installation of mag-meters

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CONSULTING ENGINEER

- completion of building finish work
- removal of bulkhead at the old plant to allow discharge of influent through the future influent channel.

Completing wiring in the pre-treatment building will take about another 30 working days. The additional time needed here is the result of revisions to the electrical system presently being authorized and put into the field. It is urged that firm costs on these items be established as quickly as possible in total and a change order obtained for their installation. This is critical to insure early resolution of extra amounts, and formal authorization of them through changes to the contract.

Thus, it appears that the pre-treatment building could be ready for clear effluent testing by June 7, 1977 (working day 621). A network for the testing process has been developed in conjunction with the owner by Mr. Simpkins and Mr. Mickelson. This network has been reviewed by all parties and apparently is acceptable in its present form. It shows a testing period of about 58 working days beginning June 29, 1977 (working day 637) and being complete September 21, 1977 (working day 695).

It would be desirable to move up the start of this testing. If the current schedule for completion can be maintained along with gaining approval to test with clear effluent, it is possible that testing could begin as early as June 7, 1977 (working day 621) or thereabouts. However, it should be remembered that in order to start this test it will be necessary to have a discharge outlet for clear effluent from 7106.

Present plans are to discharge the 7106 testing effluent into the future influent conduit of the primary tank and from there to the effluent channels out of primary tanks and into the existing facility. This flow requires that the existing facility be ready to accept the liquid which requires removal of an existing concrete bulkhead. Full testing of the pre-treatment building will not be possible until raw sewerage influent is flowing. This cannot be done until 7107 contract work is ready to receive the raw effluent from the pre-treatment building and further, the facilities that hook onto 7107 are available to remove scum, sludge and effluent from the primary tanks. Presently it is hoped to be able to start raw sewerage testing no later than June 21, 1977 (working day 631) which is when construction is expected to be complete on the primary tanks. Hopefully, this date can also be improved. It was moved back to this later point again by the need for additional wiring and revisions to the electrical system.

In summary, the project is currently in good condition with about 30 more working days of construction left prior to clear water testing possible. I suggest everything be done to reduce retention to the lowest possible

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degree and that the testing period be started no later than June 29, 1977 (working day 637), and earlier if possible. There are some residual training fees that may be difficult to expend on the project until the owner takes over the plant. It might be wise to consider placing training funds in interest bearing escrow and then receiving these with the accrued interest once the training program is over. This, of course, would presume that the Kraus-Anderson field operation could be moved off the site so the current general requirements would be reduced to zero.

The only other item remaining of substantial nature is general site work outside of the building and it is hoped this can be completed within the 30 working day period allocated for finishing interior wiring. Seeding will probably proceed as soon as possible. Sodding required may be deferred until later in the summer or early fall.

Ralph J. Stephenson, P.E.

RJS
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To: Mr. Robert Copeland, Vice President
Mr. Herb Hanson, General Superintendent
Mr. Myron Mickelson, Project Engineer
Mr. Lyle Meyer, Vice President
Mr. Gene Simpkins, Project Manager
Mr. Jerry R. Svee, Executive Vice President
Mr. Dave Thies, Estimator & Scheduler