

June 7, 1986

Subject: Report #1  
Flint/Detroit Water Program

Project: 86:41

Date of Meeting: May 27, 1986 (working day 103)

Note: Working day designations refer to working day calendar starting January 2, 1986 (working day 1).

Those attending: Jerry Kendra DSWD  
William B. Carney DWSO  
Wallace J. Benzie Genesee County  
Jim Kegler DWSO  
Ken Collard Flint  
Chuck Gray DWSO  
John Weisenberger Flint  
William Ewing Flint  
Ralph J. Stephenson Consultant

Actions taken:

- Attended general conference re overall project
- Prepared laundry list for preliminary design items
- Reviewed miscellaneous procedural matters
- Prepared network model for preliminary design of pipeline

General Summary

This meeting was the third in a series of meetings being held between the City of Detroit Water and Sewerage Department (DWSO) and the City of Flint Department of Public Works (DPW) to review design and construction of a second pipeline to the City of Flint from the Detroit water system. Meetings have been initiated by the interaction of the Michigan Department of Public Health, the City of Flint, and the City of Detroit relative to a second water supply source need for the City of Flint. The purpose of the meetings is to determine what is required on the part of all parties successfully provide a second source of water to the City of Flint while still maintaining technical, economic, and political validity of the second source in respect to the needs of the City of Detroit. Meetings will be held periodically, at present once every two weeks and probably in the near future at a less frequent interval.

Apparently there are two groups that will be meeting, one to discuss policy and the other to discuss technical matters. Policy group discussions will revolve around rates and arrangements while the technical discussions will deal with technical matters relative to the proposed new pipeline.

Minutes of the meetings will be kept jointly by Mr. Ewing and Mr. Kegler and these in turn will be merged into a single set of minutes to be distributed to those involved. My reports will contain project planning, evaluating, and monitoring observations of the work accomplished at each of the meetings, and will be prepared for each of the sessions which I attend. One copy will be sent to Mr. Ewing and another to Mr. Kegler. They in turn will distribute these reports to those they feel should have them. Graphic material and network models prepared as a result of our meetings will also be sent directly to Mr. Ewing and to Mr. Kegler for further distribution.

Below, at random, are listed some of the points discussed in our meeting on May 27, 1986 (working day 103).

1. The two basic points on the proposed water line are point A and point B. Point A is just north of Pontiac where the new line would take off from the present transmission system of the City of Detroit. Point B is somewhere on the existing 72" water line between the Genessee county boundary line and the City of Flint boundart line to the east. This 72" line is presently the only pipe supply of water from the City of Detroit to the City of Flint, and flows from Port Huron and Imlay City to the City of Flint.
2. Mr. Benzie referred in our discussions to a report on the Genessee county water supply southern loop section, prepared for the Division of Water and Wastewater in Genessee county. Apparently this report was prepared in 1969 and is still being used for reference purposes.
3. As our discussions proceeded today, it was felt by the DWSD technical staff that perhaps it is premature for the DWSD to become involved in rates and arrangements discussions. However, it would be well to keep Mr. Carney posted on progress so as his expert knowledge is required it could be provided.
4. Mr. Kegler pointed out that the DWSD has an agreement with the City of Flint relative to the supply of water. It was further mentioned that this was the basic agreement to which we must all address ourselves in all technical, or rate and arrangements matters.

**Monitoring Report #1  
Flint/Detroit Water System  
Page three**

**RALPH J. STEPHENSON, P. E., P. C.  
CONSULTING ENGINEER**

5. Considerable planning of the design process for the second pipeline has already been done. The DWSD considers these plans to be scenarios by which the second pipeline could be provided.

6. When Mr. Collard of the City of Flint arrived Mr. Kegler suggested we reconsider the frequency of the meetings. This matter will be taken under consideration.

7. As the meeting proceeded, it became clear that of prime importance is to develop an early list of activities to be done and then to mold these into a workable and reasonable plan of action. This work was undertaken after the main conference session.

8. Of major importance are the various routes that could be used for the new pipeline. There was some discussion about a route along a Consumers Power right of way. This matter is being investigated with Consumers Power presently.

There also seem to be two or three alternate routes that are feasible and each of these will be studied as a separate scenario when the preliminary design work proceeds to the point where they can be identified.

9. It was stressed by the DWSD that there will be a need for an east/west line connecting elements of the Detroit system by 1990. This line could be anywhere between the north side of Pontiac and the southern boundary of a string of counties adjoining Oxford County. There is no selection of the location as yet.

10. Planning of the new pipeline system will take into account the needs, demands and supplies for the next 25 year period.

11. The need for close cooperation between the DWSD and the City of Flint was stressed as an integral part of preparing a valid plan of action and a proper and effective pipeline installation.

12. The DWSD said that they would not address in their preliminary engineering study the issue of rates and costs. This matter must be one resolved between the prime parties involved.

13. The DWSD has developed some very powerful modeling tools by which they can predict operational and distribution demands and impacts. The present goal of the city is to provide a

system in which any one of the water plants could be taken out of service without a major impact on the system. This modeling tool will be used in a determining the new pipeline characteristics and locations.

14. Funding was discussed briefly, and it was decided on a very broad basis that conventional bonding would probably be the route to follow in financing operations. It was felt also by the DWSD staff that the project would most likely be considered a City of Detroit project. However, this matter was not reviewed in detail.

15. To close out the entire session, Mr. Jerry Kendra and Mr. Jim Kegler, both of the DWSD, and I prepared a detailed laundry list for the preliminary design of the new pipeline. We then converted this into a network model which was quantified and calculated on a very preliminary basis. The laundry list and the network model will be forwarded to Mr. Ewing and Mr. Kegler shortly. It is to be cautioned that the network model is very preliminary and does not represent a firm commitment by the DWSD relative to the design process. It must be further refined, checked, and receive additional input before it can be considered an authentic preliminary network model. However, in the interim we shall monitor and follow preliminary design work on the basis of the logic shown in the plan.

In subsequent sessions I recommend we follow the same procedures with other matters that must be carried out concurrently with the preliminary engineering design. These include studies of rates, contracts, arrangements, fees, and all other such important ancillary items.

In addition, I have stressed with Mr. Benzle of Genessee county the need for him to provide the planning group with any input or factors of critical importance to the county. These too will be evaluated and incorporated into the planning process.

The next meeting is to be held June 24, 1986 (working day 123). I will not attend that meeting. However, I plan to be at the meeting on July 8, 1986 (working day 132) at which time I suggest we continue our detailed planning of the work, also preparing additional laundry lists and procedural analyses. I shall be in touch with Mr. Ewing shortly to confirm this next meeting.

Monitoring Report #1  
Flint/Detroit Water System  
Page five

RALPH J. STEPHENSON, P. E., P. C.  
CONSULTING ENGINEER

For the present, I shall maintain my phone contacts with Mr. Ewing although as noted above, copies of this report will be sent to both Mr. Ewing and Mr. Kegler concurrently.

Ralph J. Stephenson, P.E.

RJS:sps  
To: Mr. William Ewing  
Mr. James Kegler

July 24, 1986

Subject: Report #2  
Flint/Detroit Water Program

Project: 86:41

Date of Meeting: July 8, 1986 (working day 132)

Those attending: Jerry Kendra, DSWD  
George Haberer, DWSD  
Adel Mabronk, DWSD  
Fred Tumminia, DWSD  
Jim Kegler, DWSD  
Wallace J. Benzie  
Donald Parks, Genessee County  
William Ewing, City of Flint  
John Weisenberger, City of Flint  
Charles Gray, DSWD  
Dennis Kapp, DWSD  
Ralph J. Stephenson, consultant

Actions taken:

- Made general review of overall program
- Discussed population projections
- Reviewed issue #1 of the preliminary engineering activities network dated May 27, 1986 (working day 103)
- Continued network modeling of program

General Summary

This was the fourth meeting in a series being held between the City of Detroit Water and Sewerage Department (DWSD) and the City of Flint Water Department (COFW) to review design and construction of the second pipeline to the City of Flint from the Detroit water system. Copies of the material prepared at the meeting on May 27, 1986 (working day 103) were distributed to those attending. It was noted that Mr. Kegler had annotated Report #1. His comments were as follows:

Page #2 - paragraph #1 - The word policy should be changed to financing/rates. The two groups that are meeting will discuss financing and rates, and technical matters.

Page #3 - point #9 - The word counties and county should be revised to read township.

Monitoring Report #2  
Flint/Detroit Water Program  
Page two

Page #3 - item #10 - The planning for the new pipeline system will be for the next 35 rather than 25 years, carrying the projected planning to the year 2025.

It is to be emphasized that if there are any comments or revisions to reports prepared by me, that such comments are welcome and will be noted when received.

Our major discussion at this meeting centered around several random points. They are reviewed below in no special order and are lettered for reference convenience.

- A. Property acquisition is a very critical activity and once initiated will signal the expenditure of considerable amounts of money. Property acquisition will be triggered by a final selection of the route alignment to be acquired as identified in item #30 on our network model sheet PE-2, Issue #1 dated May 27, 1986 (working day 103).
- B. Mr. Benzie said that he has plan and profile sheets for the entire Genessee county that have been converted to maps from aerial photos. These are topography flights and are about 10 years old. The topography, however, has not changed materially in the 10 years. There are some additional recent flights that have been made to show ground features that change more rapidly than do the contour lines.
- C. It was stressed that the State Health Department is pressing the issue of a second source with Flint, and that one of the major motivators of on this study and of implementing the program is to satisfy the Michigan State Health Department as to a Flint second water supply.
- D. Mr. Ewing said he will keep the State Health Department informed by sending them copies of our network models and other plan information.
- E. The City of Detroit CIP is issued each June and covers a five year period. Mr. Kegler will be responsible for seeing that information resulting from the study is fed into the City of Detroit CIP.
- F. Mr. Kegler says that the DWSD does have a work order for this study program.

Monitoring Report #2  
Flint/Detroit Water Program  
Page three

- G. Mr. Kegler copied material produced at our previous meeting for the use of those present. This initiated a discussion on how material resulting from our meetings is to be distributed. It was decided that I am to send the material to Mr. Ewing and to Mr. Kegler and that any further distribution will be from their offices. I urge that before distribution is made that both Mr. Ewing and Mr. Kegler review the information for validity and content.
- H. The DSWD gave those present population projections that were prepared by the DWSD staff. The methodology of preparing the projections was described and the DWSD requested all review the material and comment by the next meeting.
- I. Future sessions are presently scheduled as follows:
  - July 22, 1986 (working day 142)
  - August 12, 1986 (working day 157) in Davison, Michigan
  - August 26, 1986 (working day 167)
  - September 9, 1986 (working day 176)
  - September 23, 1986 (working day 186)

By the August 12, 1986 meeting the City of Flint and Genessee county are to have reviewed the preliminary network models of their work and be prepared to assign durations and to make revisions and comments on this plan of action.
- J. Mr. Kegler reviewed the broad descriptions of the possible pipeline routes. For the time being, these are known as the east route, which runs a mile or two east or west of the east boundary of Genessee county, and the west route which runs a mile or two east or west of the east boundary of the City of Flint.
- J. As part of our ongoing work, we continued preparation of the master laundry list for the project. The laundry list is a random tabulation of activities that must be accomplished to achieve the objective of the program. It was felt important to maintain the integrity of each of the lists. Therefore, codings were adopted for the numbering of the issues. The Issue #1 list was that prepared on May 27, 1986 (working day 103) and distributed by Mr. Kegler to those at the meeting. This second laundry list, Issue #2, is being sent to Mr. Ewing and Mr. Kegler for their use and distribution as appropriate. We shall continue to add to the list at each of our planning sessions.



Monitoring Report #2  
Flint/Detroit Water Program  
Page four

As part of our work at this session we also made a review of the issue #1 network model sheet PE-1, dated May 27, 1986 (working day 103). Comments made on the activities during the meeting are briefly summarized below. The item number refers to the activity number on the network model.

Activity #2 - continue (1)- identify DWSD future systems demands.

1. This deals with east and west route identification.
2. Mr. Benzie said they will also identify major take off points.
3. It was decided to use maximum days as a starting point for demand.

Activity #3- continue (1)- identify City of Flint future system demands.

1. Mr. Ewing and Mr. Benzie are to prepare this document together. It will identify major elements of the demand. Their report will contain most of the material that Flint is to give to the DWSD.
2. Mr. Ewing and Mr. Benzie said that their identification of City of Flint demand will include:

DWSD take off points (not firmly set yet)  
alternative take off points  
routes  
pressure  
demands  
preliminary cost data

Activity #11 - Prepare ground profile for several selected routes

1. The parties will be looking at various profiles and various routes.
2. COFW and DWSD should compare notes informally and frequently during this activity.

Activity #15 - Prepare hydraulic analysis for selected routes

1. These will result in preparing hydraulic profiles.
2. The results will be used to size facilities.
3. A loop analysis will be included.
4. Mr. Kegler asked if the City of Flint had any special cost curves that would be of help in this analysis. Mr. Ewing said that special information on this matter is not readily available. It was decided that standard tables would probably be used.

Monitoring Report #2  
Flint/Detroit Water Program  
Page five

Activity #17 - Prepare gross estimates for alternative routes.

1. The property requirements are not known at present and will require some guesses to be made.
2. These estimates, it was stressed, will be gross numbers.
3. These will be used to give those preparing the City of Detroit CIP preliminary cost numbers.
4. Several detailed activities will have to be identified as part of activity #17.

Activity #18 - Prepare draft study report for selected alternative.

1. The end product of this action will be a cost and preliminary alternatives analysis.
2. This analysis will be distributed both in house and outside the department.
3. The analysis will identify selected alternatives narrowed from perhaps five to ten down to two or three.

Activity #23- Resolve outstanding issues on draft study report.

1. This is a consolidation of all comments on the draft study report..
2. Sometimes it is maintained as a very formal process within the DMSD. However, with this program it may be a slightly more informal review.

Activity #25 - Issue final study report of selected alternatives to DMSD/COFW staff.

1. This study report will contain the final selected alternative.
2. The information in the report will be the basis for hard design to start.
3. The report will be the basis for start of property acquisition. To start acquisition approval from the City of Detroit council will be required.
4. The study report will require an approval by COFW and DMSD for accuracy only.

Activity #30- Make final selection of route alignment to be acquired.

1. By this time, a route has been selected and this activity formally initiates property acquisition.

Monitoring Report #2  
Flint/Detroit Water Program  
Page six

- Activity #37 - Prepare final basic requirements report.
1. This report defines pump station characteristics.
  2. The report contains line valve recommendations.
  3. The report will be the basis of detailed design of pump stations and of appurtenances.

It is the intent of each of our meetings to further refine the content of the various activities in our network model. These definitive breakdowns will then be used for preparing sub-diagrams to permit close monitoring of the entire program.

Attached to this monitoring report is a printout of the updated network model. The major addition to it has been the addition of the City of Flint and Genessee county activities that will permit the DWSD to make a final identification of future system demands. No durations were put on this City of Flint and Genessee county subdiagram since it was for preliminary study. Neither were the activities numbered in the subnetwork. We shall complete the integration of this diagram with the major summary diagram at the future session to be held on August 12, 1986 (working day 157) in Davison, Michigan.

It would be appreciated if all parties involved would review this diagram in detail and come prepared to comment on, and revise the diagram as required.

Also attached to this report is an updated copy of the master laundry list Issue #2. As with the network it would be appreciated if a complete review of the list was made and whatever additions or changes to it noted for our next session.

I shall be in touch with Mr. Ewing shortly to confirm the date and location of our meeting on August 12, 1986 (working day 157).

Ralph J. Stephenson, P.E.

RJS:sps  
To: Mr. William Ewing  
Mr. James Kegler

Sept. 4, 1986

Subject: Report #3

Flint/Detroit Water Program

Project: 86:41

Date of Meetings: August 12, 1986 (working day 157) and  
August 27, 1986 (working day 168)

Those attending August 12, 1986 (working day 157) meeting:

Ken Collard, City of Flint  
William Ewing, City of Flint  
John Weisenberger, City of Flint  
Jerry Kendra, DWSD  
James C. Kegler, DWSD  
Anthony Ragnone, Genessee County  
Wallace J. Benzie, Genessee County  
Donald Parks, Genessee County  
Ralph J. Stephenson, Consultant

Those attending August 27, 1986 (working day 168) meeting:

William Ewing, City of Flint  
James C. Kegler, DWSD  
Jerry Kendra, DWSD  
George Haberer, DWSD  
Wallace J. Benzie, Genessee County  
Allen J. LaFurgey, Genessee County  
Ralph J. Stephenson, Consultant

Actions taken:

- Continued general discussion of planning approaches and the project water use for Genessee County including the City of Flint
- Began identifying additional major planning areas
- Began discussions of possible routes for new pipe line
- Monitored progress of preliminary engineering activities Issue #2 dated July 8, 1986 (working day 132) & Issue #3 dated August 12, 1986 (working day 157) sheet PE 1
- Prepared laundry list for property acquisition (PAQ) activities
- Prepared network model for general property acquisition activities, Issue #4 dated August 27, 1986 (working day 168) sheet PAQ #1

Report #3  
Flint/Detroit Water Program  
Page two

### General Summary

The activities at the 2 meetings covered by this report will be merged unless a specific activity is identified related to either of the sessions.

At the August 12, 1986 (working day 157) meeting we evaluated the current status of the program and updated the Issue #2 network dated July 8, 1986 (working day 132). The updated network #3 dated August 12, 1986 (working day 157) incorporated the City of Flint and Genessee County activities relative to demand and route selection. These activities were then tied into the DWSD program for identifying total future system demands on the City of Detroit system from Genessee County and the City of Flint.

We shall continue in subsequent sessions to evaluate this preliminary engineering activity design network and add to it as required. Monitoring this diagram will be a very important part of our ongoing work since it reflects the fundamental structure of the process used to complete preliminary design up to where a final selection of the route alignment to be acquired can be made and to where final design of the system can be initialiated.

Points stressed in the August 12, 1986 (working day 157) included the following, noted at random:

- A. It was stressed that we must set design demands high enough in our projections.
- B. It was cautioned the projected demand reports available may not have included several future users.
- C. There was general support at the meeting for building the pipe line to accommodate an aggressive future demand. Also emphasized was the need to provide utility capacity for continual growth.
- D. A brief discussion was held at this session as to how to communicate with top political and administrative managers in the many political units involved.

It was decided at the August 12, 1986 (working day 157) meeting to generally use projections outlined in the letter and attachments from Genessee County Water and Waste Service Issue #1 dated July 17, 1986 entitled "Projected Water Use for Genessee County, including Flint" with modifications. These modifications were:

- a. To update Mundi Township statistics
- b. To add population in Beacher Metro district
- c. To correct the Clayton Township population served in the year 2,000 from 600 to 1600

Report #3  
Flint/Detroit Water Program  
Page three

- d. To reissue the report with updated information in designated in Issue #2
- E. There was considerable discussion about the various routes available. Two fundamental routes are being considered, an east and a west. No major decisions were made at this session regarding the merits of either.
- F. It was stressed that the new pipe line must get to a Flint storage and pumping facility sized to serve the demand.
- G. The county offered some suggestions as to a possible route. The City of Flint said they would provide some of their ideas in map form in the very near future.
- H. The costing and design of the appendages for the system must be done cooperatively.
- I. The City of Flint and Genessee County will each estimate appendage costs and submit to DWSD.
- J. All organizations involved will work with the same maximum day and maximum hour, demand projections.

At the meeting of August 27, 1986 (working day 168) the major topic of discussion was property and right-of-way acquisition. To assist in this Mr. Kegler provided those attending, a property acquisition process sheet which had been prepared and issued by DWSD. We reviewed this in some detail and for ease of reference numbered the boxes on each of the 3 sheets, starting in the upper left hand corner with box 1 being site selection alternatives and ending on sheet 3 in the lower right at the box labeled end with box 58. Where references are made in this or subsequent reports to box numbers, it will refer to this document. Where references are made to item numbers these will be the activity numbers on referenced network models.

Most of the planning session was devoted to the preparation of a laundry list of the property acquisition activities. This laundry list is identified as Issue #3 laundry list dated August 27, 1986 (working day 168) and is included in this report packet. The activity number in the report is shown in the far left column, followed by the column indicating the issue number which will be Issue #3. These list activities that were added on August 27, 1986 (working day 168). Responsibility codes are given next, followed by the main category of the activity and a detailed description of the activity referenced.

Report #3  
Flint/Detroit Water Program  
Page four

This list was prepared by a joint effort of the people attending the meeting and at present, represents the current scale of planning and thinking by the group. It should be recognized that in property acquisition the process of acquisition must be applied to each unit property considered. Thus, the diagram prepared today, sheet PAQ 1, Issue #4 dated August 27, 1986 (working day 168) is merely a generalized picture of how the process will operate. As we move along in our planning, and approach the point where property acquisition is actually implemented we will fill in more detail on each activity. There was general agreement that these activities shown in the laundry list Issue #3 dated August 27, 1986 (working day 168) are those that should be planned for.

Following preparation of the laundry list and using the information in the DWSD property and right-of-way acquisition process material, we prepared a network model for Flint/Detroit loop property acquisition activities. This model was put together basically by the City of Flint Water Dept., Detroit Water Dept., and myself from the laundry list provided and agreed to in the morning. In the network model sheet PAQ 1 Issue #4 dated August 27, 1986 (working day 168), the activities are shown grouped for Flint, Genessee County, and Detroit. This network, as noted above, is a very broad view of the process involved in acquiring property and basically starts when the final selection of the route to be acquired is made. This final route selection presently is shown as being made by Nov. 4, 1987 (working day 471). However, efforts are to be made at future planning sessions to bring this date to an earlier point in time.

A copy of the Issue #4 network model dated August 27, 1986 (working day 168) for property acquisition is included with this report. Since the network is printed at a 50% reduction, it may be somewhat difficult to read as well as desired. I have prepared full sized runs of the network and if desired can reduce these which will give a better quality print. However, if the enclosed size is adequate for preliminary purposes we will defer making better copies until a more definite network has been agreed upon.

Also included with this report is a copy of the notes taken at the session on August 27, 1986 (working day 168) along with an updated set of abbreviations which have been added since originally published. These notes, networks, laundry lists, and abbreviations are being provided to Mr. William Ewing of the City of Flint and Mr. James Kegler of the City of Detroit Water and Sewage Dept. Any further distribution will be by them.

Report #3  
Flint/Detroit Water Program  
Page five

It should also be mentioned that the projected water use statistics discussed at the meeting being held on August 12, 1986 (working day 157) have been updated and reissued by Mr. Benzie on August 14, 1986 (working day 159). The material contained in these was generally accepted by those at the meeting on August 27, 1986 (working day 168). However, the nature of this group did not permit any official approval be given to these projections. They will be used for preliminary design.

NOTE: On the cover of the report there is a statement "approved and adopted for use by the committee planning the development of a second pipe line from the Detroit water supply system to Genessee County."

I suggest the words approved and adopted be removed from this designation since as noted an official approval cannot be provided by this group although they can adopt it for general use subject to future and ongoing modifications that may be necessary.

The agenda for our next meeting is as follows:

Place of meeting: Detroit Water Board Bldg., 15th Floor  
Date of meeting: Sept. 9, 1986 (working day 176)  
Topics to be discussed:

- Prepare laundry list for design activities
- Prepare laundry list for construction activities
- Review and discuss diagram of property acquisition
- DWSD and COFW prepared joint progress report

To be added:

- Discuss status of projected water use report from Genessee County dated August 14, 1986 (working day 159)

I suggest that the agenda above be prepared and distributed by Mr. Ewing and Mr. Kegler as an official document from the two parties to the contract for water supply.

Ralph J. Stephenson, P.E.

RJS:gmj  
To: Mr. William Ewing  
Mr. James Kegler



October 7, 1986

Subject: Report #4

Flint/Detroit Water Program

Project: 86:41

Date of Meeting: September 23, 1986 (working day 186)

Those attending:

Ken Collard, City of Flint  
William Ewing, City of Flint  
William Mosher, DWSD  
Gerald Kendra, DWSD  
George Haberer, DWSD  
William Ashmore, City of Flint  
Wallace J. Benzie, Genessee County  
Donald Parks, Genessee County  
Ralph J. Stephenson, Consultant

Actions taken:

- Monitored progress of preliminary engineering activities
- Discussed overall progress of program
- Outlined method of submitting draft progress report
- Reviewed history of work to date on the program
- Prepared draft progress report for review and comment

General Summary

Our work at this session revolved around identification of the current status of the projects and the activities to be concentrated on over the next one to three months. At present the city and county are working on route scenarios, with the county yet to identify possible service connection locations. This activity is being put into work by them immediately. The key time target presently is for the City of Flint and Genessee County to have their estimated system mains, size, and costs completed and to the City of Detroit by November 11, 1986 (working day 221). Both are currently holding to this date.

Meanwhile, the City of Detroit is continuing to identify their future system demands and are to study possible pipe line routes to the connection point with the Flint system. Detroit is also reviewing the soil conservation service mapping documents. Another major activity just being put into work by

Monitoring Report #4  
Flint/Detroit Water System  
Page two

Detroit is the computer analysis of DWSO future system demands through a program used by DWSO for analyzing network models of their system.

The current lag in work over the expected plan of action is 5 to 6 weeks in identification of service connection locations. (Please note that in the rough draft notes for September 23, 1986 on page 2 under current status, paragraph 3, a note was made that the City of Flint had not yet started activity 59, identification of possible service connection locations. This was put into the report earlier and upon further analysis it was decided, by the City of Flint, that activity was complete. Please remove this line from your preliminary rough draft report.) However, as noted above, it is hoped by intensive effort and close cooperation between the City of Flint and Genessee County, that they will be able to have their estimated system mains, size, and costs complete by November 11, 1986 (working day 221). The sequence for this work is identified in the network model for preliminary engineering activities sheet PE 1, Issue #3, dated August 12, 1986 (working day 157) by activity numbers 60, 61, 62, 63, 64, 65, and the collector 66.

A portion of our meeting was devoted to discussing the Genessee County report on projected water use for Genessee County including City of Flint through 1990 through 2025, dated August 14, 1986 (working day 159). There is some desire on the part of the county that this document be adopted officially. As noted previously, however, the nature of this study group, does not permit official approval to be given to the report. It was agreed, however, that it would be used for the current analysis being prepared and for preliminary design activities.

It was noted that Mr. Kegler will be out of work temporary and in his absence, Mr. Mosher is acting as the project manager. He stressed that the DWSO would take aggressive technical action to the greatest extent possible and pointed out that currently DWSO has a contract only with the City of Flint. Therefore, the prime work efforts must always be, in this program, focused on the DWSO (City of Detroit) and the CDFW (City of Flint) water departments.

A question was asked by Mr. Parks as to whether the county and the city should be meeting on a somewhat regular basis due to current pipe line decisions being made in Genessee County. The answer to that from the group was a qualified yes. Both parties will make every effort to communicate, particularly at the technical level to the greatest extent possible.

Monitoring Report #4  
Flint/Detroit Water System  
Page three

At our next meeting on October 14, 1986 (working day 201) we should give final approval to a draft report and identify how it is to be prepared and distributed. Mr. Mosher and Mr. Ewing will confer by phone relative to the draft report content. For reference purposes a copy of the draft report is attached to this monitoring report. Also attached to this monitoring report are two copies each of the preliminary engineering activity network, Issue #3 dated August 12, 1986 (working day 157) and the property acquisition network model, sheet PAQ 1, Issue #4 dated August 27, 1986. These have already been provided to all members of the project team and are enclosed here to provide a more readable format. It is recommended that copies of these also be enclosed with the Progress Report #1 when it is approved and put into final form.

Our next meeting is to be held on October 14, 1986 (working day 201). The suggested agenda is as follows:

- Review status of Progress Report #1 and approve draft
- Monitor progress of project against current diagrams
- Prepare laundry list for design activities
- Prepare laundry list for construction activities
- Review and comment or revise diagram for property acquisition.

This is not a firm agenda and the actual agenda will be prepared and distributed by the City of Flint and Detroit Water and Sewage Department. The meeting will be held on the 15th floor of the Water Board Building in Detroit.

Ralph J. Stephenson, P.E.

RJS:gmj  
TO: Mr. William Ewing  
Mr. James Kegler

October 21, 1986

Subject: Report #5

Flint/Detroit Water Program

Project: 86:41

Date of Meeting: October 14, 1986 (working day 201)

Those attending:

William Ewing, City of Flint

John Weisenberger, City of Flint

William Mosher, DWSD

Gerald Kendra, DWSD

Awni Qaqish, DWSD

Wallace J. Benzie, Genessee County

Ralph J. Stephenson, Consultant

Actions taken:

- Monitored progress of preliminary engineering activities
- Revised progress report #1 to draft 2
- Prepared detailed laundry list of activities required to prepared study report of routes

General Summary

At this session we first reviewed the network model sheet PE 1, Issue #3 dated August 12, 1986 (working day 157) re preliminary engineering. As of October 14, 1986 (working day 201) activities 6, 9, 10, 12, 13, and 14 are substantially complete. Activities 60, 61, and 62 are in work.

In our discussions it was decided that we would maintain the starting date for activity 65 which is that for the City of Flint and Genessee County to begin preparing their estimated system main size and costs. Genessee County will continue their work on service location connections. Flint and the county will also begin conferring regularly in respect to the joint work that they must accomplish. It was agreed at our session that the completion of the City of Flint and Genessee County estimated system main sizes and costs would restrain item 38, make informal DWSD and City of Flint review of possible routes and demands.

Report #5  
Flint/Detroit Water Program  
Page two

Originally this activity had been shown restraining item 10. However, it was considered not essential that this be done since item 10 has been substantially completed.

The City of Detroit is meanwhile beginning to input data for item 15, prepare hydraulic analyses for selected routes. There are about 8400 data entries and this action will take considerable time. However, at present, we are holding or bettering target dates in the network model.

In our detail discussions of the current status of the project, we carefully reviewed activities 38 through 25 in the network model sheet PE 1, Issue #3 dated August 12, 1986 (working day 157). These activities concern selection of a route for the second pipeline. The activity was scheduled to be done from a date of January 9, 1987 (working day 261) through November 4, 1987 (working day 471). There is a good chance that this particular sequence can be compressed and it was decided, because of changes in the approach originally shown in the logic plan, that we should give our full attention at our next session to reprogramming this work in detail.

In light of this, the enclosed laundry list entitled, COD/COF 1 #4 laundry list dated 10/14/86, pages 1, 2, and 3 was prepared. In this laundry list there are 3 columns shown. The left column is headed des act #. This is the abbreviation for the design activity number reference in the Issue #3 network model dated August 12, 1986 (working day 157) sheet PE 1. The second column is entitled resp codes and this column at present has no entries but will be filled in by the City of Flint and the City of Detroit staffs in respect to the actions to be taken. It should be noted that the full set of responsibility codes to be used to date appears on the laundry list beginning at line 12 on sheet 1 (indicated by \*) and continuing through line 2 on page 2 (also indicated by \*).

Following the responsibility codes are the detailed activities that will be included in the network model. The activity descriptions preceded with a dash are the main class of activities shown on the network model sheet PE 1 Issue #3 dated August 12, 1986 (working day 157). This laundry list was prepared by Mr. Mosher, Mr. Kendra, and myself, and should be checked carefully by all parties to insure it is an accurate list of activities. Keep in mind that the list is not in sequence and will be merely used as a guide to preparing the detail logic plan. Copies of the list, as noted above, are attached to this report. Further distribution are to be made by those receiving the report.

Report #5  
Flint/Detroit Water Program  
Page three

Also attached to this report is a copy of the meeting notes for October 14, 1986 (working day 201). These review the current status and our discussions, as well as establishing an agenda for the October 28, 1986 (working day 211) meeting. This agenda is shown on page 2, line 3. The meeting will be held on October 28, 1986 (working day 211) at the 15th floor of the Detroit Water Board Department Building. Our main efforts there will deal with the following:

- If not complete, review draft 2 of the progress report and put in final form.
- Review the City of Flint, Genessee County estimates of system main sizes and costs.  
(There are to be completed by that date)
- Review DWSB proposal routes from the Adams pump station at the northwest corner of Adams Road and I-75, north to the Genessee County line.
- Expand plan of work in summary diagram PE 1 Issue #3 dated August 12, 1986 (working day 157).

It is critical that we complete this agenda to insure that we have a good road map of direction over the next 2 months. Due to the holidays and other conflicts, the 2 week schedule of meetings during November and December, 1986 has been somewhat disrupted. Therefore, it is essential that we provide adequate guidance to work in these 2 months to insure work can be continued on a well directed and planned basis.

Meetings that have been set are as follows:

October 28, 1986 (working day 211) 10 AM, Detroit Water Board Building - 15th floor

December 2, 1986 (working day 235) 10 AM, Flint Water Plant

January 13, 1987 (working day 263) 10 AM, Detroit Water Board Building - 15th floor

January 27, 1987 (working day 273) 10 AM, Flint Water Plant

There may be some conflict relative to holidays in the early part of next year. Both the City of Flint and the City of Detroit will check to insure that our meetings do not conflict with these holidays.

RALPH J. STEPHENSON, P.E., P.C.  
CONSULTING ENGINEER

Report #5  
Flint/Detroit Water Program  
Page four

In our session today we also made an informal review of progress report #1, draft #1. This was updated at the session and copies were finished to Mr. Ewing, Mr. Mosher, and Mr. Benzie. Further reviews of this material will be made by them and they will give me the direction that their respective administrations wish to follow in the matter of preparing and issuing the document.

The material has already been distributed informally by Mr. Benzie from draft #1. Therefore, it would be well to complete this document officially and get it in the hands of appropriate and interested parties.

Ralph J. Stephenson, P.E.

RJS:gmj  
TO: Mr. William Ewing  
CC: Mr. James Kegler

November 7, 1986

Subject: Report #6

Flint/Detroit Water Program

Project: 86:41

Date of Monitoring: October 28, 1986 (working day 211)

Those attending: (Morning Session)

Kenneth Collard, City of Flint

James Kegler, DWSD

Gerald Kendra, DWSD

Charles L. Gray, DWSD (attended informally and part time)

Adel Mabrouk, DWSD

Anthony Ragnone, Genesee County

Wallace J. Benzie, Genesee County

David W. Upmeyer, Black & Veatch

Ralph J. Stephenson, Consultant

Those attending: (Afternoon Session)

Charles L. Gray, DWSD (attended informally and part time)

William Mosher, DWSD

Gerald Kendra, DWSD

Ralph J. Stephenson, Consultant

Actions taken:

- Reviewed route alternates for pipeline
- Monitored current status of work
- Prepared detailed logic plan for preliminary design route selection process

General Summary

The initial order of business at this session was to review DWSD proposed water main routes from the Adams Station at the northwest corner of the intersection of Adams Road and I-75 to the Flint system. Mr. Kendra provided all at the meeting with



Report #6  
Flint/Detroit Water Program  
Page two

an area map indicating possible routes.

Next, Mr. David Upmeyer, of Black & Veatch, presented and discussed several alternate routes within Genesee County. Mr. Upmeyer is a consultant to Genesee County and the work he presented had been commissioned by the county. However, prior to the meeting, Mr. Upmeyer had reviewed his findings with both Mr. Benzie and Mr. Collard.

The schemes reviewed by Mr. Upmeyer were designated as alternates 1 through 4. In these alternates the base map of the distribution system for the City of Flint was used to show the routes from the Detroit system. Alternate 1 is a feed from Detroit entering the system at the east location and terminates at the Flint water plant. Route 3 is a pipeline location within the Chesapeake & Ohio right of way. This right of way is still a main line and in use. Route 4 is a feed from Detroit connecting into the proposed county loop at southeast corner of the loop.

There was considerable discussion about these 4 routes and the City of Flint, through Mr. Collard, and Genesee County, through Mr. Ragnone and Mr. Benzie, presented their views on the alternates.

Mr. Collard generally feels that either route 4 or 3 are the better locations. He will arrange a meeting with Mr. Tom Tippe of the C. & O. so he and Mr. Benzie can review the route along the railroad prior to our next meeting. Mr. Collard pointed out his preferences are first 4; then 3; next 2; with 1 being the fourth choice. There appears to be within the City of Flint some favorable attitudes by industry on this total project and these should also be followed carefully.

Mr. Upmeyer said he would prepare a summary of the Black & Veatch recommendation to incorporate into a study report for use by the project team. He will see that this is distributed to those involved. In the report will be a discussion of routes, pipeline sizes, and very rough preliminary costs. It was pointed out by a participant in the meeting, that one of the conditions of building this new pipeline is that the City of Detroit will be able to loop their water system. This is critical.

Next we discussed progress report #1 draft #2. There were no changes to this report and I was directed to type it and mail it, under my letterhead, to Mr. Ewing and Mr. Kegler. In addition I was requested by Mr. Collard to provide Mr. Ragnone a copy of the report directly. These have been mailed.

Report #6  
Flint/Detroit Water Program  
Page three

At the afternoon meeting Mr. Mosher, Mr. Kendra, and I prepared a network model for detailed work to be performed on preliminary engineering in the next few months. To prepare this model we used the larger scale diagram for preliminary engineering activities, sheet PE 1, Issue #3 dated August 12, 1986 (working day 157). We began the planning from activity 8 - prepare planning level route maps for several selected routes. It was assumed as of October 28, 1986 (working day 211) this work was complete. We also assumed that other work would begin at the October 28, 1986 (working day 211) date including activity 65, which was City of Flint and Genesee County prepare estimated system mains, size and costs.

Activity 15 was broken into several smaller sections. The 2 initial activities were to complete the review of past DWSB system operations and to enter data into the computer for selected events so as to establish the simulation model for the Detroit system.

Mr. Kendra had done considerable work in defining sub activities between activity 38 and 25 on the Issue #3 network model dated August 12, 1986 (working day 157) sheet PE 1. Therefore, we focused on using his basic logic and then assigning preliminary task durations. Because this was a study network and consisted primarily of City of Detroit Water Board activities, it was first distributed to Mr. Mosher and Mr. Kendra for further review and analysis by them and Mr. Kegler prior to publishing it for general use.

At our next session we will take the comments of the Detroit Water Board staff who have reviewed this diagram, analyze them and incorporate desired changes and revisions into the diagram.

The next session is scheduled for December 2, 1986 (working day 235) at the Flint water plant. The agenda for this session has tentatively been set as follows:

- Monitor progress of project against current diagrams
- Prepare laundry list for design activities
- Prepare laundry list for construction activities
- Review responses to progress report
- Ken Collard review discussions with Tom Tippe of the C & O
- Continue work on detailed network for preliminary design activities

Report #6  
Flint/Detroit Water Program  
Page four

It should be noted that Mr. Kegler has suggested we place a high priority on completion of the summary diagrams for design and construction of the pipeline. These items are included, therefore, as a high priority item on the next agenda.

The rough notes of the meeting of October 28, 1986 are attached to this report. These are somewhat informal and of particular concern is that the reporting on the proposed routes, presented by Mr. Upmeyer, may require further clarification and correction. Mr. Upmeyer will reduce his presentation to a written report, which will be provided to all those concerned and interested in this program. Any changes that should be made to the notes provided should be brought to my attention and the necessary revisions will be made.

Ralph J. Stephenson, P. E.

RJS:gmj  
TO: Mr. William Ewing  
Mr. James Kegler

January 24, 1987

Subject: Report #7

Flint/Detroit Water Program

Project: 86:41

Date of Monitoring: January 13, 1987 (working day 263)

Those attending:

James C. Kegler - DWSD  
Gerald Kendra - DWSD  
William Ewing - City of Flint  
John Weisenberger - City of Flint  
Wallace J. Penzie - Genesee County  
Ralph J. Stephenson - Consultant

Actions taken:

- Reviewed alternative Detroit/Flint loop locations
- Discussed current status of preliminary engineering design
- Reviewed information presently available to the Detroit Water and Sewage Department for design work
- Set agenda and date of next meeting

General Summary

There has been considerably confusion about the terminology surrounding elements of the second pipeline program. Therefore, at this session, it was decided that the definitions to be used in the future would be as follows:

Flint/Detroit loop

The second pipeline from the existing Detroit system. The second pipeline will extend to where takeoffs are made to the Flint and Genesee service area. There are presently four Flint/Detroit loop locations under consideration.

Flint/Genesee service system

The distribution/transmission system within the Flint system area that is served from the Flint/Detroit loop.

Report #7  
Flint/Detroit Water Program  
Page two

These two definitions should allow us to better define the main routings necessary in our studies. At present, Genesee County has submitted to the City of Detroit a study which discusses the Flint/Genesee service system coming off from the Flint/Detroit loop at the east of the City of Flint. However, there has been no comparable study made of the other three Flint/Detroit loop locations. One difficulty is that these locations have not been definitely established as yet. The City of Detroit has said they will put these Detroit/Flint loop locations into drawing form, hopefully on maps that are consistent in scale and detail. They will then issue them to those concerned to review and comment. The DWSD will refer to Black and Veatch's maps prepared for the county by Black and Veatch.

At our next session the suggested agenda is as follows:

- Discuss Black and Veatch's report to Genesee County. (Note: For this report to be discussed meaningfully it will be necessary for those involved to have copies. I suggest that they be obtained from the county and distributed.)
- Discuss the C & O right-of-way status. (This should be done by DPW representatives from the City of Flint.)
- Discuss Detroit/Flint loop alternatives. These are in broad terms as follows:
  - D/F loop #1 - east loop to existing pipeline
  - D/F loop #2 - east loop to Flint Water Plant
  - D/F loop #3 - central loop on C & O right-of-way
  - D/F loop #4 - east loop to southeast corner of Flint/Genesee service system

This next meeting is to be held in Detroit on February 10, 1987 (working day 283) at 10 o'clock A.M. at the Detroit Water Board Building. It is important that those involved in the decision making process attend this meeting since the matters to be discussed are critical to further progress on preliminary engineering work.

In light of the current status of work we prepared an informal update of the detail network model for the Flint/Detroit loop engineering activities. This was designated as issue #2 January 13, 1987 (working day 263). This diagram is a detailed

Report #7  
Flint/Detroit Water Program  
Page three

plan for the work from January 13, 1987 (working day 263) on through to the printing and distribution of the final route report study. In the network analysis it was found that the date of the updated issuance of the final study report was now at July 18, 1988 (working day 649). This is considerably later than the date indicated in the issue #3 network model of sheet PE 1 dated August 12, 1986 (working day 157). In this network the issuance of the final study report of selective alternatives was to have been on November 4, 1987 (working day 471).

It is important to reconcile the difference between these diagrams since the later date at present does not appear to be an acceptable completion time of the report. Pending further analysis, the detailed network model issue #2 has not yet been accepted as an official issue. It should be realized that in order for this project to be kept moving, that ongoing progress must be made in accordance with a reasonably well defined plan of action.

We shall continue to monitor progress from those documents available and consider currently the only two plans available are sheets PE 1 issue #3 dated August 12, 1986 (working day 157) and PE 2 issue #2 dated January 13, 1987 (working day 263), the detailed model between activities 38 and 25 in the summary model, PE 1. We shall continue to discuss these at subsequent programs and evaluate the project against these current standards.

I strongly recommend that Mr. Ewing and Mr. Kegler insure that all those needed at the next planning and monitoring session be notified and encouraged to attend. Of particular importance is to reach some definite conclusions on locations of the Detroit/Flint loop. Although these do not presently impact heavily upon the modeling being done, it is expected that they will begin to affect the work sometime over the next few months.

Ralph J. Stephenson, P.E.

RJS:gmj  
TO: Mr. James Kegler  
Mr. Wm. Ewing

March 31, 1987

Subject: Monitoring Report #9

Flint/Detroit Water Program

Project: 86141

Date of Monitoring: March 10, 1987 (working day 303)

Those attending:

Ken Collard - Flint DPW  
William Ewing - Flint Water  
John Weisenberger - Flint Water  
Fred Janeczko - DWSD  
William Mosher - DWSD  
Gerald Kendra - DWSD  
Wallace J. Benzie - Genesee County  
Ralph J. Stephenson - Consultant

(NOTE: On page two of Monitoring Report #8 dated February 28, 1987 the later part of line 5 reads "The right of way apparently picks up near I 75 and continues to about 4 miles south of the Grand Blanc city limits." This sentence should read "The right of way apparently picks up near I 75 and continues to a point near the Flint Water Plant.")

Actions taken:

- Continued review of criteria to be applied to route selection
- Reviewed weighting methods for criteria to be used
- Reviewed process of determining weighted value of alternatives

General Summary

The content of this meeting dealt with continuing discussions of criteria upon which location of the Detroit/Flint loop might depend.

The list prepared at the previous meeting and shown on page 3 of Monitoring Report #8 dated February 28, 1987, points A through M were reviewed and further discussed. It was decided they represent valid criteria which should be considered in the ultimate evaluation process.

Monitoring Report #9  
Flint/Detroit Water Program  
Page two

We also made a review of the terminology to be used in this evaluation and the following was agreed upon.

F = Factor in selection of a route

WF = Weight of the factor from 1 to 10

1 means of little importance  
10 means of highest importance

R = Route under consideration

V = Value of a factor for a route being considered

1 means of little value  
10 means of highest value

Y = Product of the factor weight multiplied by the value of a factor of a given route. Y then becomes the total worth of a factor for a given route.

Several points were then covered at random. These are listed below for reference.

- The technique noted above has been used by the City of Detroit and the City of Flint. Both appear to be comfortable adopting it for the present evaluation.
- Mr. Bense felt that the Detroit future service area demand is a very important element in choosing criteria for route location.
- Detroit felt that the quantity of water that they want to bring south will influence the amount that they will then bring back north.
- Some discussion ensued about criteria for routes south of the Genesee County line and those north of the Genesee County line. This matter will be looked at on an ongoing basis as the selection process evolves.
- Detroit felt there could possibly be no current advantage in making distant alternative route studies in Oakland County. The present split point is fairly well set.
- Detroit was asked whether there would be any advantage in strengthening the northwest corner of the Detroit system. This question deals with which of all the areas that the line could go through would be the best.
- A question was asked regarding use of the same factors for route selection of all parts of the loop. The answer was generally yes, the same criteria is to be used.



Monitoring Report #9  
Flint/Detroit Water Program  
Page three

- A question was also asked about whether each entity would assign the same weights to the factors. The answer seems to be probably no. This also, by implication, applies to the values assigned. It was recognized by the group that there will undoubtedly be disagreement over the weightings and values assigned by various parties. However, these disagreements will be resolved as the discussions proceed.
- At about this point the question of somehow merging the needs of the City of Flint and Genesee County into a physical demand entity arose. This might be possible by some type of joint operation that still permits the city and the county to have the ability to operate independently in selected areas.
- Generally, it was decided that each of the entities involved should be encouraged to assign weights and values separately than to move there findings and agree on a final set of weights and values.
- There was some question as to whether Oakland County should be made a part of the groupings. This matter will be made a part of the ongoing discussions.

It was next agreed that we should continue identifying potential factors to be evaluated. Therefore, several were brought up, somewhat independently of the previous factors, A through M. There undoubtedly will be duplicates of earlier factors in the new list. However, the intent now is to get as many factors as possible identified and then to begin classifying them and weeding them out, or in some cases combining where desirable.

The additional factors brought up at this session are listed below as an add to the factors A through M in Monitoring Report #8. For ease of reference these earlier factors are also listed below.

- a. - acceptability to local communities through which pipeline passes
- b. - availability of financing
- c. - benefits accruing to current available customers, potential future customers in terms of systems reliability.
- d. - capital costs
- e. - cost sharing arrangements
- f. - current contract considerations
- g. - future contract considerations
- h. - geographical divisions through which the pipeline passes
- i. - institutional requirements
- j. - operating costs

Monitoring Report #9  
Flint/Detroit Water Program  
Page four

- k. - physical characteristics of the line such as the terrain and other influencing elements
- l. - political characteristics of the areas served and through which the pipeline passes
- m. - time frames involved
- n. - level of service
  - 1. to Detroit
  - 2. to Flint
  - 3. to Genesee County
  - 4. to future service area
- o. - emergency requirements of the system
  - 1. to Detroit
  - 2. to Flint
  - 3. to Genesee County
  - 4. to future service area
- p. - normal requirements of the system
  - 1. to Detroit
  - 2. to Flint
  - 3. to Genesee County
  - 4. to future service area
- q. - maximum requirement of the system
  - 1. to Detroit
  - 2. to Flint
  - 3. to Genesee County
  - 4. to future service area
- t. - right of way availability
- u. - right of way ease of acquisition
- v. - ease of negotiating control of right of way
- w. - terrain characteristics of right of way (possible duplicate of K)
- x. - cost of right of way acquisition
- y. - present water contract considerations
  - 1. point of service take off
  - 2. franchise rights for the service
  - 3. cost allocations
  - 4. potential operational control
  - 5. emergency supply
  - 6. joint operation of the system
  - 7. potential for future change
  - 8. ease of modification of present contract

Monitoring Report #9  
Flint/Detroit Water Program  
Page five

- z. - future water contract considerations
  - 1. points of service take off
  - 2. franchise rights for the service
  - 3. cost allocations
  - 4. potential operational control
  - 5. emergency supply
  - 6. joint operation of the system
  - 7. potential for future change
  - 8. ease of modification of future contract
- aa. - design considerations
  - 1. cost of design
  - 2. effectiveness of design
  - 3. competence of designers
  - 4. responsibility of designers
- bb. - water quality
- cc. - public realtions impacts
  - 1. local
  - 2. regional
  - 3. state
  - 4. federal
- dd. - legal considerations impacting upon project
- ee. - internal staff demands
- ff. - public agency demands (such as from MDPH, EPA, DNR)
- gg. - grant eligibility
- hh. - cost recovery potential (return on investment)
- ii. - useful life

Again it is to be emphasized that many of the later additions duplicated thinking patterns in some of the earlier areas. However, for the time being, we are trying to think as randomly as possible to permit all factors that might be considered to be brought to the table.

The next step is to collate these factors and combine and set the total number to be used. It is premature to say how many criteria we should ultimately adopt by which to measure the alternate routes. However, we should be giving thought to that matter so that as criteria are developed we can identify where combinations and reductions are desirable.

There is another dimension possible with this particular technique that we may wish to consider, although it is a refinement that perhaps is not necessary at this time. This deals with the application of a third element which considers the probability of a given future. For instance, it might be that we could consider three futures for

Monitoring Report #9  
Flint/Detroit Water Program  
Page six

the system.

1. a future demand that would stay very close to the present demand
2. a future demand that would increase substantially over demand
3. a future demand that would diminish considerably relative to the present demand.

Considering alternate futures is a distinct possibility and again should be a matter of ongoing discussion as we establish the criteria.

I shall begin putting the factors we have identified to date into a data base format that can be added to, as additional discussions continue. This should then allow ease of compilation of the factor weights times the route values for each factor. It will also give us a set of work sheets that will be relatively easy to use as our discussions proceed.

Ralph J. Stephenson, P.E., P.C.

RJS:gmj

TO: Mr. William Ewing  
Mr. James Kegler

April 27, 1987

Subject: Monitoring Report #10

Flint/Detroit Water Program

Project: 86:41

Date of Monitoring: April 14, 1987 (working day 328)

Place of meeting: DWSO Office, Detroit, Michigan

Those attending:

Ken Collard - Flint DPW  
William Ewing - Flint Water  
Fred Janeczko - DWSO  
James Kegler - DWSO  
Gerald Kendra - DWSO  
Ralph J. Stephenson - Consultant

Actions taken:

- Made detailed review of criteria to be applied to route selection
- Made first and second culling passes through criteria, and selected major criteria factor for final discussions

General Summary

At the start of the meeting Mr. Kegler distributed a document entitled "Route Selection Criteria" (Brainstorm Stage), Detroit/Flint loop. In this material he had assembled the material we had discussed in previous meetings and had listed 33 route selection criteria that we should consider for inclusion in the list.

It should be noted that there were two criteria factors which had been left off monitoring report #9, dated March 31, 1987. These were added to the list used today. The missing factors were r and s. Their descriptions are as follows:

r. - capability of present system to handle flow

1. Detroit
2. Flint
3. Genesee County
4. future service area

s. - capability of future system to handle flow

1. Detroit
2. Flint
3. Genesee County
4. future service area

Monitoring Report #10  
Flint/Detroit Water Program  
Page two

Once these were added the task force selected a method by which the importance of the factor could be gaged as to whether it should or should not be included in the route selection process. It was decided that each of the now 35 factors would be discussed in detail and assigned a weight from 1 to 5 relative to its inclusion or non-inclusion in the final lists of factors used.

An important point discussed during criteria selection was that the engineering task force, headed by Mr. Kegler and Mr. Ewing, were to evaluate various COF/DWSD routes by engineering criteria through which a final selection could be considered technically sound. This task force is generally known as the task force on engineering and construction, or sometimes, as the engineering task force.

Criteria which impact upon financing, rates, and arrangements, along with other such matters are to be selected by the task force to consider financial matters. This group is generally known as the task force on rates and arrangements.

It appears that in the near future a joint effort in selection of the best route criteria for the DWSD/COF loop route will be needed between these two groups.

Once the factors shown on Mr. Kegler's list were rated, they were then arranged in ascending order of importance. This list is given below. In it the first item to appear on a line is the weight, 1 being the lowest inclusion ranking; 5 being the highest. The next item is the letter designation of the factor. Following that in parentheses, may be a series of letters. These are other factors that are considered similar to the line item factor or to be combined with it. Following the letter designations in a brief description of the factor.

- 01-aa- design considerations
- 01-b- availability of financing
- 01-bb- water quality
- 01-e- cost sharing arrangements
- 01-f- current contract considerations
- 01-g- future contract considerations
- 01-hh- cost recovery potential (return on investment)

Is there going to be a differential in cost recovery on any of the routes? Probably will result in a value analysis of present or future worth. It also could be a factor in identifying capital costs.

- 01-ii- useful life

Soil chemistry will not constitute a high initial impact on the route evaluation. However, it may affect detailed alignment within the route being considered.

Monitoring Report #10  
Flint/Detroit Water Program  
Page three

- 01-k(w)- physical characteristics of the line, ie terrain, etc.
- 01-n- level of service
- 01-o- emergency requirements of the system
- 01-p- normal requirements of the system
- 01-q- maximum requirements of the system
- 01-r- capability of present system to handle flow  
Detroit  
Flint  
Genesee County  
Future service area
- 01-s- capability of future system to handle flow  
Detroit  
Flint  
Genesee County  
Future service area
- 01-w(k)-terrain characteristics of right of way
- 01-y(z,f,g)-present water contract considerations
- 01-z(y,f,g)-future water contract considerations
- 02-ee- internal staff demands
- 02-gg- grant eligibility
- 03-c- benefits accruing to current and future customers (re-  
vised wording)  
See original list for former wording.  
Considerable discussion about this item.
- 03-cc- public relations impact
- 03-ff- public agency review and approvals (demands)  
Environmental impacts  
River crossings  
Wetlands encroachment  
Erosion controls
- 03-i- institutional requirements
- 03-jj- systems reliability  
Looping  
Pumping characteristics
- 04-dd- legal considerations impacting upon project
- 04-kk- access to route for maintenance
- 04-m- schedules (and time frames) involved
- 05-a(h,l)- acceptability to local communities through which  
pipeline passes
- 05-jl- operating costs

Monitoring Report #10  
Flint/Detroit Water Program  
Page four

- 05-j2- maintenance costs
- 05-l(a,h)- political characteristics of the areas served and passed through
- 05-t(u,v)- right of way availability
- 05-u(t,v)- ease of negotiating control of right of way
- 05-x(d)- cost of right of way acquisition

It should be noted that two additional items were added to the original list. These were:

- jj- systems reliability
- kk- access to route for maintenance

There was considerable discussion about these criteria and the engineering task force defined the criteria in some detail before making a final selection. After an exhausted discussion about the items, factors selected by the task force as those to be used for technical criteria in route ranking were as follows. The criteria as given below are arranged alphabetically and are not in any ranking of significance. The letters in parenthesis are original designations of the item. Notice in some cases items and factors have been combined.

Acceptability to local communities (a,h,l)

Definition - What it is that the communities affected by the pipeline consider beneficial or detrimental and how their feelings affect the ranking of routes.

These items should be defined in detail by those outside DWSD.

Access to route for maintenance (kk)

Definition - Analogies are best used for this factor. Might include such elements as privately owned land vs public utility right of way, sloped route vs level routes, routes traversing steeply graded areas vs routes in a river bed, road right of ways vs easements, built up areas vs rural areas.

The valuation of a route under this criteria will attempt to optimize operating characteristics of the system in the route being ranked. Will probably be given a valuation based on heavier subjective rather than objective judgements.



Monitoring Report #10  
Flint/Detroit Water Program  
Page five

Benefits accruing to current and future customers (c)

Definition - The potential for economic development, systems reliability, adequate quantity and quality, satisfying of emergency needs, public safety, health and welfare, all as impacted by the routes under consideration.

Capital costs (d,x)

Definition - All costs to the point of putting the system in service.

Such costs include (to be expanded)

- Right of way
- Design
- Construction
- Testing
- Inspection
- Site restoration
- Etc.

Institutional requirements (i)

Definition - The political, legal and contractual framework which surrounds and affects the ranking of a route under consideration.

Legal considerations impacting upon a project (dd)

(Elaborate on this)

Operating and maintenance costs (j)

Definition - All costs incurred after the system is placed in service.

Would include energy, mechanical equipment replacement, operating labor, etc.

Such costs include:

- Right of way
- Design
- Construction
- Testing
- Inspection
- Site restoration
- Etc.

Monitoring Report #10  
Flint/Detroit Water Program  
Page six

Will probably be reduced to present or future worth using operating and maintenance costs only.

Public agency reviews and approvals required (ff)

Definition - Environmental, public utility, health department, water crossing, protected land crossing, impacts on the route ranking.

Right of way availability (t,u,v)

Definition - Using examples; how convenient is it to obtain control of the property. Includes considerations of alignment suitability, obtaining easements, real estate restrictions, costs, condemnation needs, local community needs and other characteristics that improve optimization of goal and objective achievement.

Factors might include:

Ease of acquisition

Ease of control

(Must expand)

Schedules and time frames involved (m)

Definition - Duration and timing of right of way valuation and acquisition, time required for design and time required for construction, political impacts, and other factors and the manner in which they influence the ranking of a route and construction of the pipeline within it.

Considerations might include installation of local water facilities or other local facilities that would be impacted upon by the pipeline and its construction.

This basic list will now be studied in depth by members of the engineering task force and a weight given to it relative to the importance of factor in selecting any given route. It is recognized that each agency and organization involved in the route selection process, either officially or unofficially, may have a different idea of the weight that should be assigned to any given criteria factor. However, at some point, any differing opinions about weight must be resolved so the DWSB can use the weight deemed best by those most directly involved and affected.

We should continue at our succeeding sessions to narrow this selection process down and begin officially selecting and describing the routes under consideration.

Monitoring Report #10  
Flint/Detroit Water Program  
Page seven

Our next meeting is to be in Flint on May 12, 1987 (working day 348). I suggest as an agenda for that meeting we include the following:

- a. Review 9 selected factors above to determine if additions or deletions should be made.
- b. Concurrently review the definition of each factor. It might be of importance to add subfactors to the main factor that will allow more accurate weightings to be accomplished.
- c. Discuss the inclusion of other factors than the technical criteria discussed to date. I strongly recommend the chairman of the Task Force of Rates and Arrangements, Mr. William B. Carney, be invited to that session.
- d. Generate route descriptions for those loop locations under consideration, and set formal designations for these alternate routes.
- e. If time permits, begin assignment of weights and values to the system of criteria and routes.

In the interest of time, Mr. Ewing and Mr. Kegler were sent copies of the rough notes prepared at this session. These rough notes have not been distributed to any others and it is requested that if any additional parties are to be given copies of the notes that were sent out earlier or this monitoring report, that such distribution be made by Mr. Ewing and Mr. Kegler.

Ralph J. Stephenson, P.E., P.C.

RJS:gm  
TO: Mr. William Ewing  
Mr. James Kegler

May 15, 1987

Subject: Monitoring Report #11

Flint/Detroit Water Program

Project: 86:41

Date of Monitoring: May 12, 1987 (working day 348)

Place of meeting: City of Flint Water Plant, Flint, Michigan

Those attending:

William Ewing - City of Flint  
John Weisenberger - City of Flint  
Fred Janeczko - DWSD  
James Kegler - DWSD  
Wallace Benzie - Genesee County  
Ralph J. Stephenson - Consultant

Actions taken:

- Briefly reviewed route selection criteria established at previous meetings
- Discussed methods of setting route definitions
- Reviewed plans for Genesee County south loop
- Reviewed steps to be taken prior to next meeting
- Assigned weights to factors selected to date

General Summary

A document identifying the criteria selected at the previous session for initial consideration, placed in a data base format, was provided to each of those at the meeting. These were discussed in depth as the meeting progressed.

One of the first items reviewed was the identity of the routes to be evaluated. It has been generally agreed to and confirmed in report #7, dated January 24, 1987 that there are 4 basic routes from the Detroit system to the connection with the Flint system. These are as defined on page 2 in report #7, dated January 24, 1987. These are:

- D/F loop #1 - east loop to existing pipeline
- D/F loop #2 - east loop to Flint Water Plant
- D/F loop #3 - central loop on C & O right-of-way
- D/F loop #4 - east loop to southeast corner of Flint/Genesee service system

Monitoring Report #11  
Flint/Detroit Water Program  
Page two

These 4 routes have been the fundamental alternatives which have been discussed over the last several months. They have been shown on the route maps being used by the various parties and are still considered a valid portion of the analysis. However, it was pointed out at our meeting that it may be necessary to combine segments of one route with segments of another route to make a total system. It must be remembered, however, that any of the loop combinations considered, must achieve similar system objectives. These system objectives are yet to be defined in detail. It appears that in summary, one of the more important objectives is to bring emergency water to the Flint system in the ratio of 2/3 to the plant and 1/3 to a focal point near the Cedar Street reservoir. It is important to keep in mind that there will be local system installation required with nearly all of the routes under consideration.

We also discussed the Black & Veatch report to Genesee County entitled Report on Emergency Water Supply Options for Division Water and Waste Services - Genesee County Drain Commissioner. This report was prepared by Black & Veatch and is dated January 26, 1987 (working day 272).

There was some feeling expressed by the county at our meeting that this report should be used as the basis of the analysis to be made of the alternate routes. It was pointed out, however, that the Black & Veatch report was distributed to the Task Force on Engineering and Construction in February, 1987 and that the report was considered received for information and study only. Any formal action on the report was to come later and, for the time being, it was to be used only as a basis of additional study and review.

At this point in our session, it was felt appropriate to monitor the current status of the project, measuring progress against the network model shown on sheet PE-1, issue #3, dated August 12, 1986 (working day 157).

In that network model, the point at which the project presently stands, ranges around activities 15, 16, and 17. There have been hydraulic analyses and hydraulic profiles completed for some routes. However, Mr. Kegler pointed out that with the additional considerations being discussed presently, that this work will have to be extended. Gross cost estimates for alternative routes are being prepared. They too will have to consider any additional configurations of routes to be evaluated in the selection process. These gross estimates and hydraulic profiles were originally due to be finished no later than May 22, 1987 (working day 356). This work in turn lead to issuance of the final study report of selective alternatives (task 25) to be completed by November 4, 1987 (working day 471). It should be noted that from May 12, 1987 (working day

Monitoring Report #11  
Detroit/Flint Water Program  
Page three

348) to the due date for that report is only 123 working days. This is not a great amount of time, and it will be increasingly important to give careful attention to all steps of the way on an ongoing basis.

At present, the task force on Engineering and Construction is meeting only once a month. It is critical that the detailed study and analyses work that must be done in the route selection process be continued on a day to day basis between these monthly meetings. This matter was discussed and it was decided that the City of Flint and Genesee County water staffs will meet soon and completely review the Black & Veatch report noted above, including additional alternatives that might come from their discussions. Mr. Ewing and Mr. Benzie will meet with the staff of Black & Veatch shortly.

The county generally feels that the alternatives that they are interested in using are contained within the Black & Veatch report. However, the entire matter must be looked at with the idea that if additional material is needed it will be prepared. The City of Flint feels that there are several derivative combination that should be considered. This set of discussions will be set immediately and Mr. Ewing and Mr. Benzie will determine the level of managerial involvement that they must have present at these sessions for them to be effective.

By the next meeting, it is important to have adequate information so we can proceed to completing the evaluation of the criteria to be used and the weights to be assigned and move into selection of values for each factor for each route.

A further consideration is that it is considered certain that the Genesee County south loop will be in existence sometime within the next 2 or 3 years. Construction plans for the Genesee County south loop are almost complete and construction is presently planned to start close to May, 1988. The facility will require about 1½ years to install with completion presently set for November, 1989. Thus, this south loop system must be considered as a part of the total projected Detroit/Flint loop.

We briefly discussed the focal point to which water must be brought, particularly on the west side of Flint. Two thirds of the emergency water must be brought to the treatment plant but one third must be brought to the Cedar Street reservoir. To fill the reservoir is a pumping operation and the City of Flint staff pointed out that the station would have to be shut down to refill the reservoir and that a dedicated pump would be required. It is important to define the various geographic locations of key elements of the system, particularly on the west side.

Monitoring Report #11  
Flint/Detroit Water Program  
Page four

So this matter can be discussed in detail at our next session, the DWSD staff will try to provide updated maps of additional configuration. However, participants are asked to bring their copies of the current route maps since duplication of these are difficult.

It is anticipated that Mr. Carney, chairman of the task force on Rates and Arrangements will also be at the next meeting and therefore, any discussion of matters, other than technical and engineering, should be reviewed in advance for discussion with Mr. Carney as appropriate.

To close out our meeting we discussed the assignments of weights to the various factors selected to this point. These are shown on the attached document entitled DWSD/COF Route Evaluation Weight Selection. In this the nine factor descriptions are shown, along with the weight from 1 to 10 assigned these by the various people attending the meeting. For the meaning of the various abbreviations please see the attached DWSD/COF route abbreviation sheet, also attached to this report.

In the evaluation the weights were assigned independently by each one at the meeting. They were then totaled and averaged. Next the top and bottom figure for each factor was discarded and an adjusted average. Please note that items 5, 6, 8, and 9, which have asterisks in the right hand column, should be rechecked. It appears that there may be some discrepancy between the adjusted average calculation and the actual weight used. We should discuss this at our next session to assure that the weights used are an accurate reflection of what is desired by the group.

Also attached to this report are a full set of abbreviations for the pipeline loop planning program to date shown on the cover page of the attachment. The next 3 sheets are a set of edited notes from our meeting. These notes unedited were reviewed at the meeting and some minor changes have been made in this final copy. It would be appreciated if those concerned would review those notes to insure they are an accurate reflection of our session.

The next meeting is to be held on June 9, 1987 (working day 367) at the DWSD office in Detroit, Michigan. A suggested agenda for this meeting is as follows:

1. Make final review of weighting method and confirm results from preliminary weightings.
2. Review City of Flint and Genesee County water discussions with Black & Veatch and the outcome of the meetings.

Monitoring Report #11  
Detroit/Flint Water Program  
Page five

3. Better identify the role of task force on Rates and Arrangements relative to route selection.
4. Begin a detailed definition of the routes to be evaluated including the combination routes.
5. As time permits, assign values to factors for each route.

At our meeting today, the question was asked whether each individual should assign their own weights and values to the factors and routes to be evaluated. Although this can be done as desired, and certainly it is possible that it would be of help in the final evaluation, the general decision was that a consensus should be reached on the weights and then to apply them to the values, either individually or collectively. Since the material is stored in a data base format, mathematical revisions and updating are easily accomplished.

Ralph J. Stephenson, P.E.

RJS:gmy  
TO: Mr. Wm. Ewing  
Mr. James Kegler



June 23, 1987

Subject: Monitoring Report #12

Flint/Detroit Water Loop Program

Project: 86:41

Date of Monitoring: June 9, 1987 (working day 367)

Place of Meeting: DWSD office, Detroit, Michigan

Those attending:

William Ewing - City of Flint

John Weisenberger - City of Flint

James Kegler - DWSD

William Carney - DWSD (in meeting part time)

William Mosher - DWSD

Gerald Kendra - DWSD

Wallace J. Benzie - Genesee County

Ralph J. Stephenson - Consultant

Actions taken:

- Reviewed role of the rates and arrangements task force in total program
- Reviewed basic purposes of the loop
- Reviewed some of the operating implications of the loop
- Made preliminary review of 7 routes currently proposed by DWSD
- Set general procedures for ranking routes

General Summary

Mr. Carney was able to attend this meeting part time and participated actively in a discussion of the rates and arrangements task force impact upon the present loop studies. He stressed that his task force would be more deeply involved after the route is selected. No major influence is expected to be exerted by them on the preliminary engineering considerations presently being considered.

Monitoring Report #12  
Flint/Detroit Water Program  
Page two

Mr. Carney was able to provide some insight into the elements his group may be concerned with in the second supply to Flint. One of these was to loop the Detroit system so as to have the possibility of a two way flow. Also, as has been a basic purpose from the start of this study, the line must provide a second source of water to Flint.

This is a critical matter and brought up the point of again reviewing the basic purpose of the loop. Because of changing influences on the work, it is sometimes helpful to go back and restate the fundamental purposes of any engineering work being done.

Four purposes of the loop were considered. These include:

1. To provide an emergency supply to the City of Flint
2. To provide looping capabilities in the DWSD system
3. To provide a supply of water from DWSD to Genesee County
4. To serve a future expanded service area

There was a considerable discussion as to the applicability of points 3 and 4. There was some discussion about whether 2 is a basic purpose of the loop or whether it is a condition that must be fulfilled. All agreed, however, that item #1, to provide an emergency supply to the City of Flint by providing a second source, was the bedrock purpose of the loop. This lead some to ask whether or not the same criteria will be applicable if the purpose of the loop is to satisfy all or some of points 2, 3, and 4.

This appears to me to be an important decision to make. I strongly recommend the task force on engineering and construction consider what purposes the rating method for the present 7, and possibly more alternatives, shall be based upon.

It was further pointed out that the entire system is considered as the cost when rate considerations are being reviewed. There are different methods of establishing costs and cost allocations depending on whether the system has one take off point or multiple take off points. There is some thought that the cost of the total system might possibly be influenced by the use and the purpose of the loop. This is particularly the case in a matter where there is a possibility that the loop would serve some other basic need that merely providing an emergency second source to Flint.

Since there will be a need for recovery of capital costs of the system there probably will be a need for a DWSD customer rate increase. This rate increase is an important element in the evaluation and, again, I suggest the task force on engineering and construction carefully review what magnitude of rate increase will be needed.

Monitoring Report #12  
Flint/Detroit Water Program  
Page three

So far as contract arrangements for purchase of water by the City of Flint, the City of Flint is not necessarily interested in negotiating a new contract with DWS. However, it was pointed out by the DWS that there will undoubtedly will have to be amendments to the present contract in respect to the new DWS/COF loop.

Another technical matter brought up by Mr. Carney was that probably the DWS would want to operate the loop. The question was asked as to whether or not this would cause any problems. The City of Flint felt that possibly there might be some operating problems between the City of Flint and the DWS and between Flint and Genesee County if operation of the loop is by DWS.

It was felt generally that technical design problems could be resolved easily.

Operational problem areas pointed out by the City of Flint included pressure reduction characteristics, system flow controls, and the level of service required from the line. Genesee County does not want to build storage facilities and the City of Flint wants now to receive all DWS water at the water plant. This is a change in position relative to the previous allocation of a 2/3, 1/3 distribution between points of receipt by the City of Flint. The City of Flint does not want to receive any water at the Cedar Street reservoir.

As this discussion proceeded, Mr. Kegler provided those at the meeting with 7 drawings showing loop location alternatives 1 through 7. He also provided a gross cost estimate for each of the 7 items. Mr. Kegler said the DWS has driven over all the routes and that these rough maps indicate approximate locations, costs, and quantities. He urged that they be studied and that the cost estimated by DWS be reviewed. It was pointed out that costs do not include the following:

1. pumping stations
2. easements
3. property acquisitions
4. engineering
5. inspection
6. legal fees
7. contingencies

Those at the meeting felt that engineering, inspection, legal, and contingencies would generally run between 20% to 30% of the capital costs of the system.

Monitoring Report #12  
Flint/Detroit Water Program  
Page four

A major item of the analysis was the metro loop, which was a constant cost in all 7 schemes, extends from the southern most region of the system to a loop point designated as 110 on the maps. This loop was valued at 49.2 million dollars and constituted a relatively high percentage of the total costs of all systems. The minimum cost loop was #1 at a total cost, exclusive of the items above, at 113 million.

The most expensive plan was alternate 7, which excluding the items mentioned above, was estimated at 141.0 million dollars. The other 5 costs estimated were very close to the cost of #1 with the maximum of those 5 alternates being #4 at 118.1 million.

It is extremely important that the selection process take into consideration constant costs that may be common to all schemes. In fact, it is important to the entire analysis that we, always continue to compare like objects.

In other words, if the loop must provide a water supply to the plant then all facilities that are needed to bring the water supply to the plant must be included in all cost projection.

The various routes were shown by Mr. Kegler on the master route map in different colors. These colors are as follows:

- Alternative #1 - orange
- Alternative #2 - green
- Alternative #3 - red
- Alternative #4 - yellow
- Alternative #5 - blue
- Alternative #6 - orange dotted
- Alternative #7 - green dotted

As the alternatives were discussed the question was asked by some if we could eliminate any of the alternatives immediately. This lead to a fairly complex discussion. The conclusion was, that although it might appear that some could be eliminated summarily, that it would be difficult for all to agree as to which factors should be eliminated. It was considered best to leave in all routes under consideration, and in fact to add whatever other derivatives of the basic routes might be possible.

Future analyses of the route should accomodate the following conditions:

1. Pump stations and property acquisition estimates are to be added to the costs.
2. There will be consideration given to dropping costs of

Monitoring Report #12  
Flint/Detroit Water Program  
Page five

the metro loop from the analysis.

3. Costs will be continually refined, revised, and updated.
4. All alternatives will be designed and costed so as to provided 100% of the water to the Flint water plant.

A further evaluation will be done after receipt by the parties of the updated material. This material is to be sent out by the DWSD by June 30, 1987 and copies will be forwarded to Mr. Ewing, Mr. Benzie, and Mr. Stephenson.

The studies of the alternative routes will also include each key person preparing a preliminary rating of the routes prior to our next meeting in July. Mr. Kegler of the DWSD will tabulate evaluations prior to the next meeting so they will be fully available for discussion.

Included with this report is a blank copy of the evaluation form showing the weights agreed upon at our previous session on May 12, 1987 (working day 348).

Another item that should be considered at our next meeting is dropping the metro loop from the cost analysis. This is important since the question has to be answered as to whether the 96 inch line is necessary to provide an emergency second supply to the City of Flint.

For our next meeting the agenda decided upon include the following:

1. Discuss route ratings prepared ahead of meeting by those individuals participating
2. Rank routes
3. Make summary evaluation of rankings
4. Attempt to select routes for preliminary recommendation.

This will be an important meeting since we are drawing close to the date by which the final study report of selected alternatives is to be issued to the DWSD/COF staff. The date of this issue is targeted for November 4, 1987 (working day 471). Today's meeting date of June 9, 1987 (working day 367), only 94 more days prior to this report being issued as a final study report.

Monitoring Report #12  
Flint/Detroit Water Program  
Page six

To close our session we set the future meeting dates as follows:

July 14, 1987 - City of Flint water plant

(Note: There is some consideration in a change of this date.  
If it is revised, adequate notice of a new date will be sent  
to those concerned.)

August 11, 1987 - DWSO office in Detroit

September 8, 1987 - City of Flint water plant

(Note: A copy of the rough notes of the meeting of June 9, 1987  
are attached to this report.)

Ralph J. Stephenson, P.E.

RJS:gmy  
TO: MR. WM. EWING  
MR. JAMES KEGLER

July 18, 1987

Subject: Monitoring Report #13

Flint/Detroit Water Loop Program

Project: 86:41

Date of Monitoring: July 14, 1987 (working day 391)

Place of Meeting: Flint Water Plant, Flint, Michigan

Those attending:

Ken Collard - City of Flint  
William Ewing - City of Flint  
James Kegler - DWSD  
William Mosher - DWSD  
Gerald Kendra - DWSD  
Anthony Ragnone - Genesee County  
Wallace Benzie - Genesee County  
Ralph J. Stephenson - Consultant

Actions taken:

- Reviewed route ratings prepared by DWSD and City of Flint
- Discussed route evaluation in detail
- Made summary evaluation of route ratings
- Set agenda for next session discussion

General Summary

The parties involved in officially rating the various routes are the City of Detroit Water and Sewage Department and the City of Flint Department of Public Works. For the DWSD, four parties prepared a route evaluation, Mr. James Kegler, Mr. Gerald Kendra, Mr. William Mosher, and Mr. Fred Janeczko. An average was taken of these four evaluations and used in the DWSD ratings. Mr. William Ewing made the route evaluation for the City of Flint. The county declined to give a route evaluation. In lieu of this, they suggested an alternate #9. This route was reviewed in depth at our session today.

Another item discussed at our meeting was route #8 which would function only as a second feed to Flint. This was eliminated from the evaluation early since it was not a comparable relative to the factors being considered for the others.

Monitoring Report #13  
Flint/Detroit Water Loop Program  
Page two

The ratings for each route as presented, are given below.  
Number in ( ) indicate relative rank.

<u>Route #</u>	<u>DWSD</u>	<u>City of Flint</u>
1	347 (1)	420 (1)
2	314 (3)	281 (2)
3	248 (5)	277 (3)
4	274 (4)	272.2 (4)
5	330 (2)	281 (2)
6	274 (4)	272 (5)
7	218 (6)	263 (6)

The sizable amount by which route 1 was ranked best suggested to the group that this would be the best of the routes to focus upon. It is a route that comes into the easterly portion of Genesee County, and on the route map heads north to point 380, and from there could be taken off to run along Davison and then northward to the Flint Water Plant.

There was some question about what caused the noticeable differentials between the DWSD and the City of Flint routes 2 and 5. Mr. Kegler pointed out this may be due to the sizable spread in some of the evaluation sheets. No major discussion was continued on this point. Thus, after some preliminary discussion, both the City of Flint and the DWSD decided that #1 was the best choice.

Genesee County representatives mentioned that they felt it would be better DWSD/COP loop connection could be taken off from further west. This was the reason they had suggested their alternative 9. At this point, the discussion was generally opened to a full review of all factors that might possibly contribute to making a final decision in this matter. These discussions are summarized in the attached set of notes. Some of the comments are abstracted and noted below.

- There was considerable interest in the method of financing the work to be installed, and particularly work that was to be financed out of the rate structure. It was emphasized by the DWSD that any discussion of rate structures would have to be by the rates and arrangement task force, and not by the engineering and construction group. There was no authoritative answer to the question as to whether a rate increase was likely for the improvements, however, it has been mentioned in previous meetings that there is good likelihood a rate increase would be necessary to finance the DWSD/COP loop.



Monitoring Report #13  
Flint/Detroit Water Loop Program  
Page three

- The City of Flint staff recommended that we further evaluate route #1, along with a westerly route. The county would still like to consider routes #5 or #9.

Therefore, the group began looking at the potential for a further westerly route based upon the #9 concept. Mr. Kegler said they could cost out a route #9 and would be glad to do so provided one could be identified.

- There was additional ongoing discussion about the need to consider operating characteristics of the system. In general, the DWSB will operate all parts of the line that complete the loop which will connect, in any scheme, at some point to the present 72 inch east west line. However, there is a series of considerations that must be given to the operating characteristics of the COE/DWSB loop that must be explored as the route location is narrowed down.
- Further discussions must be held regarding contract arrangements. Since contract arrangements for primary provision of water to the Flint system is between the City of Flint and Detroit, these discussions must involve these two parties as the authentic contract participants. Any discussions regarding the purchase of water from the City of Flint must be held between the City of Flint and the party to whom they sell water; in this case, Genesee County.

There were several informal points made about methods by which the county could connect directly to the Flint/Detroit loop. However, these were not able to be considered at this session, since the primary contract arrangements here are between Flint and Detroit.

It was felt, however, that the discussions are at a point where it would be profitable for Mr. Ken Collard, DPW Director in Flint and Mr. William Carney, chairman of the task force on rates and arrangements to meet and address some of the points brought up by Mr. Collard during the discussion. One of these dealt with the meanings of the various words that are used in discussing financing and rate structure. Another concerned the meaning of the term building costs into the rate structure. In addition, the entire matter of financing the new City of Flint/City of Detroit loop must be carefully considered by all parties having a financial interest in the project.

Conclusions drawn from this meeting

1. Route #1 is to be further considered in greater detail. At present, it is the prime candidate for selection as the route of the new Flint/Detroit water loop.

Monitoring Report #13  
Flint/Detroit Water Loop Program  
Page four

2. The DWSD will evaluate costs and desirability of an alternate route #9. This route generally follows the suggested route #5 to McCandlish, proceeds west on McCandlish to Vassar, goes north on Vassar to Perry, then west on Perry to Belsay, north on Belsay to Potter, and then north on Belsay to Richfield and west on Richfield to the Flint water plant. The connection to the existing Detroit pipe line would be at Potter.

The county is requesting takeoffs at McCandlish and Vassar, Perry and Belsay, Maple and Belsay, and Atherton and Belsay.

3. Once the evaluation data for route #9 is prepared by Detroit, they will send a copy to Mr. William Ewing, who will further evaluate the route. Any review of this alternate with Genesee County personnel will be initiated by the City of Flint and the county. It was suggested that the county be involved in evaluation and discussion of the factors being judged.

4. A discussion of routes #1 and #9 will be a major part of our next evaluation meeting on August 11, 1987.

5. Once the factors have been evaluated and the relative merits of the two routes studied, discussions may be initiated with Mr. Bill Carney, chairman of the task force on rates and arrangements, to further clarify financing arrangements and the impact on the rate structure. These discussions will probably be initiated by City of Flint DPW personnel.

General

The next meeting of the task force on engineering and construction is to be in Detroit on Tuesday, August 11, 1987 at 10 A.M. The agenda for this meeting is as follows:

1. Complete detailed review of routes #1 and #9.
2. Address as many pending problems as possible relative to the impact of the task force on rates and arrangements upon the final selection of a route.
3. Decide upon and make a final selection of the route to be used.

Evaluating the current status of preliminary engineering activities against sheet PE1, issue 3, dated August 12, 1986; it appears we are still holding a target date of November 4, 1987 (working day 471) for issuing the final route study report of selected alternatives to the DWSD and COF staff. November 4, 1987 (working day

Monitoring Report #13  
Flint/Detroit Water Loop Program  
Page five

471) is only 80 working days from the monitoring date, July 14, 1987 (working day 391). In that period of time, the activities to be completed can be seen in the network to include 18, 19, 20, 21, 22, 23, 24, and 25. These items are as follows:

- Activity 18 - prepare draft study report for selective alternates.
- Activity 19 - issue draft study report to DWSD and COF staff (including route recommendations).
- Activity 20 - City of Flint staff review and comment on draft study report.
- Activity 21 - DWSD staff review and comment on draft study report.
- Activity 22 - Analyze draft study report comments.
- Activity 23 - Resolve outstanding issues on draft study report.
- Activity 24 - Prepare final study report of selected alternates.
- Activity 25 - Issue final study report of selected alternates to DWSD and City of Flint staff.

Thus, between now and early November, 1987, the above items of work are to be accomplished after which the program will move into preparation of the basic requirements report, and then on into the next phase of work.

I suggest at our next meeting we begin discussing this next phase of work since it is possible that some compression of time may occur between now and the issuance of the draft study report. Therefore, we should be ready to move into following work phases and have a plan in front of us from which to evaluate progress.

Please note, a copy of the meeting notes from our session today is attached to this report.

Ralph J. Stephenson, P.E.

RJS:gmj  
To: Mr. William Ewing  
Mr. James Kegler

September 23, 1987

Subject: Monitoring Report #14

Flint/Detroit Water Loop Program

Project: 86:41

Date of Monitoring: September 8, 1987 (working day 430)

Place of Meeting: Flint Water Plant - Flint, Michigan

Those attending:

William Ewing - City of Flint

John Weisenberger - City of Flint

James Kegler - DWSD

William Mosher - DWSD

Gerald Kendra - DWSD

Wallace J. Bencie - Genesee County

Ralph J. Stephenson, P.E. - Consultant

Actions taken:

- Reviewed material for draft study report provided by Mr. Kegler of DWSD re Detroit/Flint loop route selection
- Discussed method of selecting final route to be used
- Monitored and evaluated progress against current network model

Monitored from sheet PE 1 for preliminary engineering activities Flint/Detroit loop, issue 1, dated August 12, 1986 (working day 157).

General Summary

Mr. Kegler provided a packet of 7 draft study report items regarding the Detroit/Flint loop. This material was accompanied by a covering letter dated September 3, 1987 to Mr. William Ewing, copies to Mr. Bencie, and Mr. Stephenson. In essence, the 7 items transmitted represented the issuance of 7 sections of the draft study report, described in activity 19 of the network model for the Flint/Detroit preliminary engineering activities, sheet PE 1, dated August 12, 1986 (working day 157). Issuance of this draft study report, including route recommendations, was to have been completed by the morning of July 28, 1987 (working day 401).

Monitoring Report #14  
Flint/Detroit Water Loop Program  
Page two

The 7 sections submitted do not constitute the full report, however, and more material will follow. However, it is the starting point and it appears that probably review and approval of these sections can overlap further submittals.

The current lag on the project from the issue 3 network model referred to above appears to range from 40 to 50 working days. It should be noted that this network model anticipated issuance of a final study report of selected alternatives to the DWSD and the City of Flint staff by the morning of November 4, 1987 (working day 471). If we use the 40 working day lag, the issue date of this report could be extended into early or mid January, 1988. It is possible that some of the lost time can be regained and a compression made in the activities following the issuance of the draft study report.

The procedure from issuance of the draft study report to the DWSD staff and the City of Flint staff includes:

- 20 and 21 - review and comment on draft study report
- 22 - analyse draft study report comments
- 23 - resolve outstanding issues on draft study report
- 24 - prepare a final study report of selective alternatives
- 25 - issue final study report of selected alternatives to DWSD and City of Flint staff

Following these activities, work is concentrated on determining operational hydraulics, final service connection locations, and firm estimated costs, and then preparing a basic requirements report which was ultimately to be issued in late May, 1988. It is hoped that enough time can be picked up in the draft report preparation and the issuance of the basic requirements report so this date could be met or bettered. This matter will be discussed at subsequent meetings of the group.

The material provided by Mr. Kagler was discussed in some detail and comments on the various attachments are given in the meeting notes accompanying this report. A brief review of the comments is given below.

Attachment #1 - Service Area

Some minor corrections were made to this section of which probably the major was that Grand Blanc Township should be included in the current service area and that Lennon and Otter Lake should be removed from the discussion material completely.

Attachment #2 - Flint Water Demand

No comments or revisions suggested.

Attachment #3 - Route Development

No comments or revisions suggested.

Monitoring Report #14  
Flint/Detroit Water Loop Program  
Page three

Attachment #4 - Route Description

It was emphasized that alternative 8 on page 15 of this attachment mentioned that the alternative would not provide DWSU looping function. This is an important item to understand in consideration of alternative 8. Other than the above emphasis, there were no comments or revisions discussed.

Attachment #5 - Alternative Route Rankings

Mr. Bennis noted that Michigan Bell Telephone has bought the C & O Railroad right of way. Other than this, there were no other major comments or revisions discussed.

Attachment #6 - Route Recommendations

Mr. Bennis requested information on what the major detractors of route #9 were. It was mentioned that Flint rated route #9 lower than other, generally because of capital cost, institutional requirements, reviews and approvals required, right of way availability, and the scheduling involved. There were further questions as to whether the rates and arrangements group should comment on reconsiderations relative to the selections.

It was also emphasized that the Detroit Water and Sewage Department would finance and build only the pipe lines and systems represented by the solid lines on the route maps. All dotted line installation would be by others, presumably the City of Flint. There were no dissenters from this interpretation of the report.

Mr. Bennis also asked if there would be some expansion of the recommendations statement from the present one paragraph discussion. There was no full answer to this question.

Attachment #7 - Description of Route Evaluation Criteria

No comments or revisions suggested to this section.

It should be kept in mind that these 7 attachments, as with subsequent material, are to be further studied and commented upon. The intent is to have all comments back to Mr. Kegler at the DWSU by September 22, 1987 (working day 440). This is very important and critical to timely movement of the project into the final route selection and reporting portion of the plan.

We next reviewed items to be done in the near future and also set the dates for future meetings. Dates agreed upon are:

- October 13, 1987 (working day 455) - in Detroit
- November 10, 1987 (working day 475) - in Flint
- December 8, 1987 (working day 494) - in Detroit
- January 12, 1988 (working day 517) - in Flint
- February 9, 1988 (working day 537) - in Detroit

Monitoring Report #14  
Flint/Detroit Water Loop Program  
Page four

I called attention to the fact that I would not be able to be at the meeting on October 13, 1987 (working day 455).

Items to accomplish now include planning for the detailed design phase, which will be the responsibility of Mr. Charles Gray and the design division.

Also we should revise, as required, the land acquisition plan with Mr. George Haberer. Acquisition of financing and dealing with rates and arrangements will probably require little, if any, formal diagramming. Therefore, our work in the near and immediate future will still focus on the route selection report, on preliminary work on the detailed design phase, and whatever additional planning is to be done for land acquisition.

I shall write to Mr. Ken Collard, Mr. William Ewing, Mr. James Kegler, and Mr. William Carney re my involvement in these future planning sessions. I strongly recommend that those areas that are capable of a reasonable degree of pre-planning and management direction be incorporated into our overall network modeling program. This, so they can be easily tracked for the very complex job of designing and constructing the loop pipe line, and getting it into service. Of great importance here is the meshing of the solid line pipe lines to be built by DWSD and the dotted line pipe lines to be built by others. There is a similar process to be followed for each in that a route has to be selected, all land has to be acquired, design of the pipe line and its accessories carried out, financing obtained, and the facilities built. The work must be closely tied together if the two, the loop and the local lines, are to be put into service concurrently.

Our agenda for the October 13, 1987 (working day 455) will consist of a detailed review of comments on the material issued by Mr. Kegler as a portion of the draft study report and briefly reviewed above. It is essential to reach agreement between the City of Flint and the City of Detroit on the content of this report, just as quickly as possible.

I shall be in touch with those concerned in the very near future to confirm the dates and the agenda for subsequent meetings. Copies of the notes taken at the September 8, 1987 (working day 430) meeting are attached. Mr. Kegler and Mr. Ewing are requested to distribute the monitoring report and the attachments to appropriate parties for their review and discussion.

Ralph J. Stephenson, P.E.

RJS:gay  
To: Mr. Wm. Ewing  
Mr. James Kegler

November 21, 1987

Subject: Monitoring Report #15

Flint/Detroit Water Loop Program

Project: 86:41

Date of Monitoring: November 10, 1987 (working day 475)

Place of Meeting: Flint Water Plant - Flint, Michigan

Those attending:

William Ewing - City of Flint  
John Weisenberger - City of Flint  
James Kegler - DWSD  
William Mosher - DWSD  
Fred Janesko - DWSD  
Wallace J. Benzle - Genesee County  
Ralph J. Stephenson, P.E. - Consultant

Actions taken:

- Discussed study report entitled "Draft Study Report - Second Flint Water Supply Line", dated October 15, 1987 (working day 457)
- Discussed future actions of task force

General Summary

Mr. Kegler and Mr. Mosher provided the task force with copies of the "Draft Study Report - Second Flint Water Supply Line", dated October 15, 1987 (working day 457). This study report furnished the background information for our discussions at this session. Mr. Kegler asked for comments on the report. There were some but the report was generally accepted.

Mr. Weisenberger questioned the large potential shortfalls for emergency demands, identified in the tables on page 9. It appears, however, that these capacities and supplies are fixed by the physical configuration presently under consideration. If there is to be any additional improvements, or any agreements for DWSD to provide additional water, it will have to be a contract matter to be discussed with the rates and arrangements task force. Mr. Kegler said that consideration of the matter is beyond the work scope of the current task force.

Mr. Ewing questioned if flows from the Adams Station were average, maximum, or other. He was told that the rates shown on page 9 are average rates of flow from Adams.

Mr. Benzle had no early comments on the report at this time.



Monitoring Report #15  
Flint/Detroit Water Loop Program  
Page two

One revision discussed was to the hydraulic profile shown in figure #13. At the top right of the profile, under the dimension "future Flint mains", the 3rd pipe size from the left, shown as 30 inches, will be made 36 inches. However, text changes will not be made in the draft copy text. All present made note of this on their copy of the report.

It was decided, by the task force, that the report should now be put into final form. Thus, the next step will be to complete the material and assemble it, ready for distribution. Mr. Janosko said that probably the report will be issued about January 7, 1988. The planning group, which has carried the bulk of the work to date for the DWSD, will turn the report over to finance group at the DWSD, who will be deeply involved from this point on.

The DWSD staff pointed out that there is a very sizable backlog of projects presently awaiting action by the DWSD. They have no way of predicting where the DWSD/COF pipeline project will fall within that backlog, nor what priority will be given it in the list of projects to be done. However, the planning will complete their report and submit it so the next step can be taken.

An action that will be taken, prior to final formulation of the report, is that the DWSD will discuss the recommendations with Oakland County staff. The second pipeline is of great interest to them and they have been kept informed re our progress on the work.

In all likelihood, an executive summary is to be prepared to accompany the report. This summary will include figure 3, cost information in narrative form, and the summary shown on the first 2 pages of the draft study report. Mr. Ewing said, that without the executive summary, he would need 20 copies of the report and Mr. Bensie said he would need 20 copies without the summary. With the executive summary, Mr. Ewing will need 20 copies of the executive summary and 6 copies of the full report. Mr. Bensie would like 20 copies of the executive summary and 4 of the full report. This material will be forwarded to the appropriate parties upon its completion.

We next discussed subsequent actions of the technical task force. It was decided at this session that there will be no more routine meetings of the task force until the report is published in January, 1988. However, if meetings are required for special purposes, they will be called by either or both, the DWSD and the City of Flint.

We discussed briefly, dissolving the technical task force. However, this matter will be held pending decisions on whether additional work might be appropriate for this task force to assume.

We also considered the advisability of publishing a progress report #2. Progress report #1 was published to Mr. Ewing, Mr. Kogler, and Mr. Anthony Ragnone by Ralph J. Stephenson, P.E. on October 31, 1986 (working day 214). This report was provided to the Michigan Department of Health by the City of Flint.

Monitoring Report #15  
Flint/Detroit Water Loop Program  
Page three

I shall prepare a draft of progress report #2 and submit it to Mr. Ewing and Mr. Kegler for their consideration, since no final decision was made at this session as to whether a report should be prepared or not. I shall use the format of progress report #1, dated October 31, 1986 (working day 214) as a guideline. If there are any comments about this matter, please phone or write me as quickly as possible.

It should be observed that the network model which has been used as a guid and monitoring document (sheet PE 1, issue 3, dated August 12, 1986 (working day 157)) indicated the report draft was to have been issued by July 28, 1987 (working day 401). It was actually issued on October 14, 1987 (working day 456). The final draft of the study was to be issued by November 4, 1987 (working day 471). Present plans are for an issue by January 7, 1988 (working day 514). The network model being used indicates that once the final report has been issued, it will lead to preparation of the basic requirement report and on through to the point where the final basic requirements report is officially issued. This date in the network model, issue 3, dated August 12, 1986 (working day 157) was set at May 31, 1988 (working day 616).

There may be some need for the technical task force to continue its review and evaluation of the program as it moves into the basic requirements area. However, the callings of such meetings will be done on an as needed basis by Mr. Ewing, Mr. Kegler, or jointly.

Although, the route study report was issued later than desired, the task force and the participants at the working level, are to be commended for their attention to detail and the diligence exhibited in evaluating a number of alternatives. The final selection of a route was arrived at by careful consideration of many factors and through a very objective evaluation and weighing of the merits of each alternative.

It has been a pleasure to work with the task force and on this very critical project and I shall look forward to ongoing progress in the design and construction of the second pipeline from Detroit to Flint. I shall wait to hear from Mr. Ewing and Mr. Kegler as to the next steps to be taken on the overall project.

Ralph J. Stephenson, P.E.

TO: Mr. Wm. Ewing  
Mr. James Kegler

RJS:gnv