

ENCLOSURE 2

BRUNSWICK STEAM ELECTRIC PLANT, UNITS 1 AND 2
NRC DOCKET NOS. 50-325 & 50-324
OPERATING LICENSE NOS. DPR-71 & DPR-62
REQUEST FOR LICENSE AMENDMENT
SERVICE WATER SYSTEM

EER 91-0039

EVALUATION OF SERVICE WATER DESIGN BASIS CAPABILITY

E2-1

9308170125 930809
PDR ADOCK 05000324
P PDR

FOR INFORMATION ONLY

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FORM 1

ENGINEERING EVALUATION
REPORT

EER No. 91-0039
Rev. No. 0
Page No. 1

1. Reference NCR, LER, WR/JO, etc. 1-PT-24.6.4 & SP 91-006 File No. 4060

2. Brief description of item/activity EVALUATION OF SER- ☒ Class A (Q-List)
VICE WATER DESIGN BASIS CAPABILITY ☐ Class B-3 (FP-Q)
☐ Other

3. Disposition
☒ a. Use/acceptable as is
☐ b. Permanent repair/rework
☐ c. Temporary change; Expiration date _____
☐ Temporary repair
☐ Temporary condition
☐ JCO/STSI (☐ Preliminary)
☐ d. Other _____

4. Final Resolution
☒ a. Complies with FSAR, design, drawing, code, and quality requirements.
☐ b. Acceptable deviation from FSAR, design, drawing, code, or quality requirements. Safety review (AI-109) required.

5. Follow-up Requirements
☐ a. Surveillance activities, responsible group(s) _____
☐ b. Action items, responsible group(s) _____
☒ c. None

6. Review/Approval
Responsible Engineer * Regis Stated Date 2-6-91
☒ Yes ☐ No Technical Review * Peter Wright Date 2-6-91
Engineering Supervisor S. H. Bishop Date 2/6/91
☐ Yes ☒ No EQ Review Date —
☒ Yes ☐ No QA Review J.C. Watson Date 2/6/91
☐ Yes ☒ No ONS/CNS Review Date —
☐ Yes ☒ No PNSC Review Date —
Approved S. H. Bishop Date 2/6/91

7. Distribution:
Document Control (EER File) Other:
NED BESS Section Manager
Manager - Maintenance
Supervisor - ISI
Responsible Engineer
Q-List/EDBS Coordinator - PEG
Operations Principal Engineer
Nuclear Engineering Department (NED-Raleigh)
Specialist - Regulatory Compliance
NED EQ Group - Raleigh
EDC - Technical Support
QA Engineering

*Qualified Technical
Reviewer if Quality
Class A and box 4b
checked

ENGINEERING EVALUATION

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1-21	0

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* Not Applicable

I. PROBLEM EVALUATION

A. PROBLEM DESCRIPTION

During the Winter 1990-91 BSEP U1 Refueling Outage, several modifications were implemented that affected the hydraulic characteristics of the Service Water (SW) system. Although the individual plant modifications included acceptance testing which ensured that those modifications individually did not impair the capability of the system to perform its design basis function, they did not comprehensively test the entire system. Therefore, as committed to the NRC, Periodic Test 1-PT-24.6.4 was run to demonstrate the hydraulic capability of the SW system in meeting the design basis flow requirements to safety related components and to measure system leakage through the cross-tie valves. Data resultant from 1-PT-24.6.4 would be used to calibrate the latest BSEP U1 SW KYPIPE computer hydraulic model; this calibrated model would then have the worst-case accident scenarios run upon it. Capability of the SW system would then be judged based on the flow shown on the output of these worst-case scenario computer runs.

However, during the performance of 1-PT-24.6.4, it was observed that while the two Nuclear Service Water Pumps (NSWPs) "A" and "B" were running in parallel, discharging into a common header, the "A" pump consistently had higher flow values as measured by the Controlotron portable ultrasonic flow meter. Since these two pumps are essentially identical, their flow output when discharging into a common header should be close to equal. Since there was some suspicion that the "B" pump may have experienced degradation which allowed the "A" pump to "overpower" it when the two were running in parallel, it was decided to perform more testing to specifically investigate and compare the two pumps' flow characteristics. SP-91-006 was written and implemented to observe the two pumps' performance characteristics over a range of flows, both while the pumps were operating together and singly.

The purpose of this Engineering Evaluation is to analyze the data provided by 1-PT-24.6.4 and SP-91-006 to find if there is a concern regarding NSW pump degradation, to calibrate the latest KYPIPE hydraulic model of the SW system, and to apply the worst-case accident scenarios to this model to determine whether or not the SW system is capable of meeting its design basis requirements.

B. EVALUATION/DISPOSITION

Periodic Test 1-PT-24.6.4 took data at three different SW system line-ups; all three line-ups had both Nuclear Service Water Pumps (NSWPs) operating in parallel. Flow values for the two NSWPs as observed during that test are shown below (the data sheets from 1-PT-24.6.4 are included in this EER as Attachment A):

TABLE 1: 1-PT-24.6.4 NUCLEAR SERVICE WATER PUMP FLOW DATA

1-PT-24.6.4 STEP NO.	NSWP 1A FLOW	NSWP 1B FLOW
9.3.29	5664.0 gpm	4601.25 gpm
9.3.33	5387.0 gpm	4668.0 gpm
9.3.42	5693.0 gpm	4810.0 gpm

As can be seen by comparing the two pumps' flow values, the discrepancy or mismatch between the two pumps varies from 719 to 1063 gpm. Since the two pumps are essentially identical and are discharging into a common header, their flows should be identical. One of the possible explanations for this anomaly is that NSWP "B" had experienced some kind of degradation which was causing it to operate off of its established performance curve. If this was the case, then the ability of that pump to provide design-basis required flows when it was operating alone would be in question. Due to the nature of these pumps, their performance when operating alone cannot be inferred from observation of their operation in parallel. Furthermore, the data from 1-PT-24.6.4 was taken at basically the same total flow value, so it could not be determined if this flow mismatch only existed in the flow regime observed in that test, or if the flow mismatch would exist at all flow values. Thus, more testing was needed which would portray pump performance operating together and alone, and at a variety of flow regimes.

Special Procedure SP-91-006 was written to take pump flow as well as intake and discharge pressure data to compare and validate the previously established performance curves used in the KYPIPE SW hydraulic model. Performance data could be compared to determine if one pump had experienced any performance degradation relative to the other pump. Results of this procedure (Data taken in

SP-91-006 is included in this EER as Attachment B) showed that when one NSWP operated alone, its Developed Head (and therefore its flow) was essentially identical to the other pump's Developed Head when pumping into an identical system. Also, when the two pumps ran in parallel, their Developed Heads matched. Furthermore, their performance agreed with what was anticipated from referencing the previously established pump curves. The discrepancies in pump flows seen in 1-PT-24.6.4 were attributed to the effects of different NSWP discharge strainer pressure drops between the two NSWPs and inaccuracies in the permanent installed instrumentation and the test instrumentation. Although the Controlotron ultrasonic flow meter readings from SP-91-006 were found to be inaccurate (placement of these meters to achieve more accurate data will be evaluated in a future project) for the individual NSWP flows, the totalled NSWP flow readings were reasonable when compared to the flow received by the SW system, and tracked well with changes in the system's lineup.

Since SP-91-006 showed that both NSWPs were running on their previously established performance curves, then the SW KYPIPE hydraulic model would not require alteration in NSWP curve input data, and the results obtained in 1-PT-24.6.4 could be used to calibrate the model.

The SW KYPIPE computer hydraulic model was calibrated by adjusting input data for minor losses for the various branches until the output flows closely matched the resultant flows from 1-PT-24.6.4. Since combined pump flow readings obtained from the Controlotron flow meters in SP-91-006 were found to be trustworthy, the combined pump flow readings taken in 1-PT-24.6.4 were used to adjust the SW cross-tie leakage flow parameters in the KYPIPE hydraulic model during model calibration. The hydraulic model calibration was made under the KYPIPE data file titled "U1CALBN2"; the results file and the input data file are included in this EER as Attachments C and D, respectively. A comparison of calibrated model flows versus system test flows is provided in the table on the following page.

**TABLE 2: COMPARISON OF FLOW VALUES FROM 1-PT-24.6.4 TEST
AND CALIBRATED KYPIPE MODEL (All flows in gpm)**

COMPONENT	STEP 9.3.29		STEP 9.3.33		STEP 9.3.42	
	TEST	MODEL	TEST	MODEL	TEST	MODEL
NSWPs 1A & 1B Combined Flow	10265	10723	10055	10589	10503	10808
SW Lube Water	131	131	124	124	127	127
DG 1 SW	1386	1341	1300	1337	1300	1321
DG 2 SW	1422	1402	1428	1398	1392	1382
RBCCW SW	3400	3400	3300	3300	3300	3300
RHR SW A Loop	3000	3000	0	0	0	0
RHR SWBP A M/C	67.5	67.3	0	0	0	0
RHR SWBP C M/C	66.2	67.0	0	0	0	0
RHR SW B Loop	0	0	3000	3000	3000	3000
RHR SWBP B M/C	0	0	66.5	58.0	65.8	56.7
RHR SWBP D M/C	0	0	63.6	64.7	63.3	57.9
RHR Pump Room Cooler A	484.8	479.1	467.1	478.1	463.6	471.7
CS Pump Room Cooler A	91.2	91.4	91.2	91.2	90.6	90.0
RHR Pump Seal Coolers A & C	33.8	33.4	32.1	33.3	31.2	32.9
RHR Pump Room Cooler B	406.2	408.9	402.2	405.9	400.8	400.5
CS Pump Room Cooler B	66.2	66.2	62.0	65.7	61.7	64.8
RHR Pump Seal Coolers B & D	31.5	30.5	30.1	30.3	30.4	29.9

Now that the KYPIPE had been successfully calibrated, it could be used to have several worst-case accident scenarios run upon it to determine if the SW system could fulfill its design basis functions.

Several worst case 0 to 10 minute accident scenario files were chosen from Calculation G0050A-12 (although this is a BSEP Unit 2 calculation, it was referenced since its listing of scenarios is currently more complete than the comparable Unit 1 calculation). During the first ten minutes of an accident scenario, operator action to throttle or close valves is not considered; thus the primary concern is that the NSWPs will exceed their maximum flow limits. A worst case 0 to 10 minute accident scenario was chosen for each of the NSWP Intake Bay water levels of interest: Low Bay Level (-6.0'); High Bay Level (+2.0'); Flood Bay Level (+22.0'); and Low-Low (formerly referred to as Hurricane Bay Level) Bay Level (-8.63'). Where there was more than one worst case scenario for a given bay level, an alternate worst case scenario was chosen and run as well. The scenarios chosen are copies of the system responses given in the Calculation G0050A-12 files listed in the table below:

TABLE 3: WORST CASE ACCIDENT SCENARIOS: FILE NAMES		
BAY LEVEL	ELEVATION	FILE NAME & CHANGE NOS.
Low	-6.0'	U2NOPOWR Changes 7 & 8 NOVTLHDR Changes 14 & 15 (Alt.)
High	+2.0'	U2NOPOWR Changes 5 & 6
Flood	+22.0'	NOVTLHDR Changes 16 & 17 RBCCWOUT Changes 4 & 5 (Alt.)
Low-Low	-8.63'	RBCCWOUT Changes 2 & 3

For each NSWP Intake Bay water level, there is a corresponding maximum flow limit for the NSWPS. This flow limit is based upon ensuring that the pump is not endangered due to loss of Net Positive Suction Head (NPSH); that is, the flow limit ensures that available NPSH always is greater than or equal to the required NPSH. The actual flow limits are divided by 1.05 to account for the KYPIPE hydraulic model's $\pm 5\%$ accuracy. Thus, the resultant maximum flow values that are allowable NSWP flows in the KYPIPE output are shown on the following table:

TABLE 4: MAXIMUM NSWP FLOW LIMITS

BAY LEVEL	WATER ELEVATION	ACTUAL FLOW LIMIT	KYPIPE FLOW LIMIT
Low	-6.0'	9292 gpm	8849 gpm
High	+2.0'	9552 gpm	9097 gpm
Flood	+22.0'	10000 gpm	9523 gpm
Low-Low	-8.63'	8225 gpm	7833 gpm

The scenarios shown in Table 3 were then run on the calibrated KYPIPE SW hydraulic model under the file name U1SCNRIO (the results file and the input data file are included in this EER as Attachments E and F, respectively). The results are tabulated below.

TABLE 5: RESULTANT FLOWS FROM KYPIPE WORST CASE SCENARIOS

U1SCNRIO CHANGE NOS.	SCENARIO COPIED FROM: (FILE & CH. NO.)	WATER ELEV.	KYPIPE ALLOWABLE FLOW	OUTPUT FLOW FROM U1SCNRIO
0 & 1	U2NOPOWR Ch. 7 & 8	-6.0'	8849 gpm	8347 gpm
2 & 3	U2NOPOWR Ch. 5 & 6	+2.0'	9097 gpm	8496 gpm
4 & 5	NOVTLHDR Ch. 16 & 17	+22.0'	9523 gpm	8951 gpm
6 & 7	RBCCWOUT Ch. 2 & 3	-8.63'	7833 gpm	7833 gpm
8 & 9	RBCCWOUT Ch. 4 & 5	+22.0'	9523 gpm	8559 gpm
10 & 11	NOVTLHDR Ch. 14 & 15	-6.0'	8849 gpm	8524 gpm

As can be seen from Table 5, all the output flows from the worst case scenarios are less than or equal to the maximum allowable KYPIPE flow limit for the relevant water level.

As an additional check, an additional KYPIPE run was performed to simulate the worst case after 10 minute accident scenario; in

this time frame, operator action to shut or throttle unnecessary flows can be credited providing that the action is feasible in that scenario (i.e., operator action cannot be assumed to manually close a valve during a postulated LOCA scenario that began during operational modes 1, 2, or 3; likewise, operator action cannot be assumed to go out to the Diesel Generator Building and throttle the DG SW valves during a postulated hurricane). Since operator action can be considered for throttling or closing valves in the after 10 minute cases, exceeding the NSWP maximum flow is not a concern. Instead, the prevailing concern is ensuring that the various heat exchangers which require cooling during this time frame receive sufficient SW to allow them to meet their design basis cooling functions. Since the hydraulic model has a $\pm 5\%$ accuracy of flow output data, the flows obtained from the KYPIPE after 10 minute scenario are reduced by 5% before comparing to the minimum flow requirement of the particular heat exchanger. The worst case after 10 minute scenario is a copy of the system response given in Calculation G0050A-12, File U2NOPOWR Change No. 4. This scenario as run on the calibrated KYPIPE model is listed in the "U1SCNRIO" file as Change No. 13; it is included in this EER as Attachments E and F for the results file and input data file, respectively. A comparison of KYPIPE heat exchanger flows to the minimum flow values is tabulated on the following page.

**TABLE 6: COMPARISON OF AFTER 10 MINUTE HEAT EXCHANGER FLOWS:
KYPIPE WORST-CASE SCENARIO FLOWS
VERSUS
MINIMUM HEAT EXCHANGER FLOWS**

HEAT EXCHANGER	KYPIPE OUTPUT FLOW	95% OF KYPIPE OUTPUT FLOW	HEAT EXCHANGER REQUIRED FLOW*
SW Lube Water	113 gpm	107 gpm	95 gpm
DG 1 SW	1054 gpm	1001 gpm	350 gpm
DG 2 SW	1102 gpm	1047 gpm	350 gpm
RHR (B Loop)	2994 gpm	2844 gpm	2500 gpm**
RHR SWBP B M/C	44 gpm	42 gpm	38 gpm
RHR SWBP D M/C	45 gpm	43 gpm	38 gpm
RHR Pump Room Cooler A	367 gpm	349 gpm	186 gpm
CS Pump Room Cooler A	70 gpm	66 gpm	47 gpm
RHR Pump Seal Coolers A & C	26 gpm	25 gpm	0 gpm
RHR Pump Room Cooler B	311 gpm	295 gpm	186 gpm
CS Pump Room Cooler B	50 gpm	48 gpm	47 gpm
RHR Pump Seal Coolers B & D	23 gpm	22 gpm	0 gpm

* All minimum flow requirements assume 90°F Service Water

** 2500 gpm minimum RHR SW flow requirement since this postulated scenario began during operational mode 4 or 5

As can be seen from the table, all flow outputs from the KYPIPE model worst case after 10 minute scenario were above the relevant

minimum flow requirements. Thus, the SW system is capable of meeting its design basis functions.

C. CORRECTIVE ACTIONS

No corrective actions are required by this EER.

D. ACCEPTANCE TESTING

No acceptance testing is required by this EER.

II. EER ACTION ITEM NOTIFICATIONS

No action items, and therefore no action item notifications, are required by this EER.

III. SAFETY REVIEW

See page 13 of this EER.

IV. EQ IMPACT EVALUATION

See page 21 of this EER.

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CP&L SAFETY REVIEWPage 1 of 8

SAFETY REVIEW COVER SHEET

DOCUMENT NO. EER 91-0039REV. NO. 0SUMMARY DESCRIPTION OF TITLE: EVALUATION OF SW DESIGN BASIS CAPABILITY

1. Responsible Supervisor, Assign:

Safety Analysis Preparer: ROGER STECKELSafety Evaluator: ROGER STECKELSafety Reviewer: PETER WRIGHT

2. Safety Analysis Preparer: Complete PART I, SAFETY ANALYSIS

3. Safety Evaluator: Complete Part II, Item Classification and Routing Screen.

4. Safety Evaluator: For procedure changes, Part III may be completed. If either question 1 or 2 is "yes," then Part IV is not required; skip to number 8 of this cover sheet.

5. Safety Evaluator: Determine which DISCIPLINES are required for review of this item (including own) and denote by checking the appropriate block below. Fill in names of QUALIFIED SAFETY REVIEWERS in space provided.

DISCIPLINES Required:

(Print Name)

☐ Nuclear Plant Operations☐ Nuclear Engineering☒ Mechanical☐ Electrical☐ Instrumentation & Control☐ Structural☐ Metallurgy☐ Chemistry/Radiochemistry☐ Health Physics☐ Administrative ControlsROGER STECKEL

6. Each person denoted in step 5 perform a first level SAFETY REVIEW and provide input into the UNREVIEWED SAFETY QUESTION determination. Safety Evaluator complete Part IV.

7. Each person denoted in step 5 sign the completed Part IV, indicating completion of a first level SAFETY REVIEW.

8. Safety Reviewer: Perform a SAFETY REVIEW in accordance with Section 8.0.

☒ The activity does not create an UNREVIEWED SAFETY QUESTION.☐ The activity may create an UNREVIEWED SAFETY QUESTION.

Safety Reviewer

Peter WrightDate 2-6-91

DISCIPLINE:

Mechanical9. Responsible Supervisor: All DISCIPLINES necessary and important to the item have been reviewed: [Signature] Date 2-6-91

10. PNSC review: If required, attach a completed Part V.

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PART I: SAFETY ANALYSIS

(See instructions in Section 8.4.1)
(Attach additional sheets as necessary)DOCUMENT NO. EER 91-0039 REV. NO. 0SUMMARY DESCRIPTION OF TITLE: EVALUATION OF SW DESIGN BASIS CAPABILITYDESCRIPTION OF CHANGE: SEE ATTACHEDANALYSIS: SEE ATTACHED

REFERENCES:

SEE ATTACHED

SAFETY ANALYSIS PREPARER:


ROGER STECHELDATE: 2-6-91

ATTACHMENT A
CP&L SAFETY REVIEW
PART I: SAFETY ANALYSIS (Cont'd.)

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FOR
EER 91-0039

DESCRIPTION: This EER serves to analyze and evaluate Service Water system test data taken in Periodic Test 1-PT-24.6.4 and Special Procedure SP-91-006. The data was analyzed by several means to ensure its reliability, then it was used to calibrate the existing Service Water KYPIPE hydraulic computer model, including a calibration of the system crosstie leakage. Once the computer model was successfully calibrated, it was used to run several worst case accident scenarios. The resultant flows from these scenarios were compared to the allowable limits for the SW system (the NSWP flows for the 0-10 minute scenarios to ensure pump runout or NPSH problems do not exist, and the heat exchanger flows for the after 10 minute scenarios to ensure these heat exchanger receive sufficient Service Water to perform their design basis functions). The comparison of flows resultant from the computer scenarios to the limiting SW flows showed that the system remains capable of fulfilling its design basis purposes.

ANALYSIS: This analysis is for the mechanical discipline. This EER merely serves to analyze data already taken under previously approved procedures (1-PT-24.6.4 and SP-91-006). This EER does not physically change any portion of the Service Water or any other system. The EER shows the SW system to be capable of performing its design basis duties during an accident/transient coincident with a single failure. No document revisions are required resultant from this EER. No action items are resultant from this EER.

REFERENCES:

- (1) TS 3/4.7.1.2
- (2) TSI 90-03, Rev. 0
- (3) BSEP FSAR Chapters 9 & 15
- (4) Calculations G0050A-10 & -12
- (5) SW System Hydraulic Analysis Report
- (6) 1-PT-24.6.4
- (7) SP-91-006

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PART II: ITEM CLASSIFICATION AND ROUTING SCREEN

DOCUMENT NO. EER 91-0039REV. NO. 0

- | | Yes | No |
|---|--------------------------|-------------------------------------|
| 1. Does this item represent a change to the facility or procedures as described in the SAFETY ANALYSIS REPORT, or a test or experiment not described in the SAFETY ANALYSIS REPORT? | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 2. Does this item involve a change to the individual plant Operating License or to its Technical Specifications? | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 3. Does this item require a revision to the FSAR? | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 4. Does this item involve a change to the Offsite Dose Calculation Manual? | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 5. Does this item constitute a change to the Process Control Program? | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 6. Does this item involve a major change to a Radwaste Treatment System? | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 7. Does this item involve a change to the Technical Specification Equipment List Program? | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 8. Does this item constitute an unreviewed environmental question defined in the SHNPP Environmental Protection Plan or a significant environmental impact (Brunswick and H.B. Robinson NPDES Permits)? | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 9. Does this item involve a change to a previously accepted: | | |
| a. Quality Assurance Program | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| b. Security Plan (including Training, Qualification, and Contingency Plans)? | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| c. Emergency Plan? | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| d. Independent Spent Fuel Storage Installation license? (If yes, refer to appropriate site procedure for 10CFR72.48 requirements.) | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

IF THE ANSWER TO ANY OF THE ABOVE QUESTIONS IS "YES", THEN IDENTIFY THE BASIS DOCUMENT AND SECTION(S) INVOLVED. SEE SECTION 8.4.2 FOR INSTRUCTIONS FOR EACH "YES" ANSWER.

REFERENCES:

FSAR: CHAPTERS 9 & 15; TS 3/4.7.1.2; TSI 90-03

Safety Evaluator	DISCIPLINE <u>MECHANICAL</u>	SIGNATURE <u>Royce [Signature]</u>	DATE <u>2-6-91</u>
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PART III: CHANGES TO PLANT PROCEDURES

DOCUMENT NO. EER 91-0039REV. NO. 0Yes No

1. Does this item represent a change to procedures for which a 10CFR50.59 EVALUATION is required and is the change fully addressed by another completed UNREVIEWED SAFETY QUESTION determination? (See Section 7.2.2.5)

☐ M

REFERENCE DOCUMENT: _____

REV. _____

2. Is the change a non-intent change which does no more than: (See Section 7.2.2.3)
- a. Correct typographical errors which do not alter the meaning or intent of the procedure; or,
 - b. Add steps for clarification (provided they are consistent with the original purpose or applicability of the procedure); or,
 - c. Change the title of an organizational position; or,
 - d. Change names, addresses, or telephone numbers of persons; or,
 - e. Change the designation of an item of equipment where the equipment is the same as the original equipment or is an authorized replacement; or,
 - f. Change a specified tool or instrument to an equivalent substitute; or,
 - g. Change the format of a procedure without altering the meaning, intent, or content; or
 - h. Delete a part or all of a procedure, the deleted portions of which are wholly covered by approved plant procedures?

☐ M

If the answer to either Question 1 or Question 2 in PART III is "Yes," then PART IV need not be completed.

Safety Evaluator: DISCIPLINE SIGNATURE / DATE
MECHANICAL Ryan [Signature] / 2-6-91

ATTACHMENT A
CP&L SAFETY REVIEW

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PART IV: UNREVIEWED SAFETY QUESTION DETERMINATION

DOCUMENT NO. EER 91-0039 REV. NO. 0

Using the SAFETY ANALYSIS developed for the change, test or experiment, as well as other required references (LICENSING BASIS DOCUMENTATION, Design Drawings, Design Basis Documents, codes, etc.), the preparer of the SAFETY EVALUATION must directly answer each of the following seven questions and make a determination of whether an UNREVIEWED SAFETY QUESTION exists.

* A WRITTEN BASIS IS REQUIRED FOR EACH ANSWER

- | | <u>Yes</u> | <u>No</u> |
|--|------------|---------------------------------------|
| 1. May the proposed activity increase the probability of occurrence of an accident evaluated previously in the SAFETY ANALYSIS REPORT?
<u>SEE ATTACHED</u> | [] | <input checked="" type="checkbox"/> M |
| 2. May the proposed activity increase the consequences of an accident evaluated previously in the SAFETY ANALYSIS REPORT?
<u>SEE ATTACHED</u> | [] | <input checked="" type="checkbox"/> M |
| 3. May the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety evaluated previously in the SAFETY ANALYSIS REPORT?
<u>SEE ATTACHED</u> | [] | <input checked="" type="checkbox"/> M |
| 4. May the proposed activity increase the consequence of a malfunction of equipment important to safety evaluated previously in the SAFETY ANALYSIS REPORT?
<u>SEE ATTACHED</u> | [] | <input checked="" type="checkbox"/> M |
| 5. May the proposed activity create the possibility of an accident of a different type than any evaluated previously in the SAFETY ANALYSIS REPORT?
<u>SEE ATTACHED</u> | [] | <input checked="" type="checkbox"/> M |

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Yes No

6. May the proposed activity create the possibility of a malfunction of equipment important to safety of a different type than any evaluated previously in the SAFETY ANALYSIS REPORT?

☐ Yes ☒ No
SEE ATTACHED

7. Does the proposed activity reduce the margin of safety as defined in the basis of any Technical Specification?

☐ Yes ☒ No
SEE ATTACHED

Based on the answers to questions 1 - 7, does this item result in an UNREVIEWED SAFETY QUESTION? If the answer to any of the questions 1-7 is "Yes", then the item is considered to constitute an UNREVIEWED SAFETY QUESTION.

☐ Yes ☒ No

If, in answering question 1 or 3, it was determined that the probability did in fact increase, but the increase was small relative to the uncertainties; or, in answering question 2 or 4, it was determined that the consequences increased, but the consequences were still less than the NRC ACCEPTANCE LIMIT; or, in answering question 7, a parameter would be closer to the NRC ACCEPTANCE LIMIT, but the end result was still within the NRC ACCEPTANCE LIMIT; then PNSC review is required.

PNSC REVIEW REQUIRED FOR ABOVE REASON(S)?

☐ Yes ☒ No

REFERENCES:

TS 3.4.7.1.2; TSI 90-03, REV. 0; FSAR CHAPTERS 9 & 15;
CAHS G0050A-10 & -12; SW HYDRAULIC ANALYSIS REPORT;
PT 24.1 & 4; SP 91-006

	DISCIPLINE	SIGNATURE	DATE
Safety Evaluator:	<u>MECHANICAL</u>	<u>[Signature]</u>	<u>2-6-91</u>
Other QUALIFIED			
SAFETY REVIEWERS			
(as appropriate)			

Additional Sheets Attached?

☒ Yes

☐ No

ATTACHMENT A
CP&L SAFETY REVIEW

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PART IV: UNREVIEWED SAFETY QUESTION DETERMINATION (Cont'd.)

FOR
EER 91-0039

1. The data analysis and system evaluation performed by EER 91-0039 will not increase the probability of occurrence of a previously evaluated accident in the FSAR. The EER only serves to evaluate the Service Water system's capability to perform its design basis duties during an accident; no physical work, documentation changes, or action items result from this EER. Thus, this EER has no impact on any previously analyzed accident occurrence probability.
2. This EER does not increase the consequences of a previously FSAR-evaluated accident. As stated above, this EER only analyzes data taken during the performance of previously approved procedures, and has no bearing whatsoever on previously analyzed accident consequences.
3. The probability of occurrence of a previously evaluated malfunction of safety-related equipment does not change because of this EER. This EER only evaluates an existing system for its design basis capability; equipment malfunctions are not affected.
4. The consequences of safety-related equipment malfunction will not change from that which has been already analyzed. This EER only analyzed system capability; it has no impact upon previously performed equipment malfunction studies.
5. No new accident scenario is being introduced by this EER. Previously analyzed accident scenarios were re-analyzed under this EER for the existing system which had undergone modification during the recent outage; no concerns were raised from these analysis results, and no new accident scenarios were discovered in this EER.
6. No new safety-related equipment malfunction possibility is raised by this EER. This EER re-evaluates the previously analyzed accidents and equipment failures, but does not introduce any new equipment failures beyond those previously studied.
7. This EER does not reduce the margins of safety given in the Technical Specifications; on the contrary, it affirms that the existing margins of safety still apply. This EER analyzed the recently-modified SW system using the existing accident scenarios coincident with the previously studied equipment single failures and found that the system remains capable of performing its design basis functions.

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FORM 3

ENGINEERING EVALUATION REPORT
 ENVIRONMENTAL QUALIFICATION IMPACT FORM (EER-EQIF)

Will the evaluation, on either a temporary or permanent basis:

1. Justify the deletion of equipment/common components from the BSEP EQ program?
☐ Yes ☒ No
2. Justify the addition of (already existing) equipment/common components to the BSEP EQ program?
☐ Yes ☒ No
3. Authorize the repair of EQ equipment/common components with other than qualified like-in-kind equipment/component parts?
☐ Yes ☒ No
4. Affect the existing installation or interface (of EQ equipment/common component applications) as may be designated in EDBS and/or in the qualification data package (including changing the type of interface/installation)?
☐ Yes ☒ No
5. Justify the (quality class) upgrade of equipment/common components or component parts which could be utilized in EQ applications?
☐ Yes ☒ No
6. (Re)Define qualification parameters (e.g., normal or LOCA/HELB environmental conditions, postaccident operating time requirements, essential passive/active postaccident operating requirements, qualified life assumptions/results, etc.) for specific EQ equipment?
☐ Yes ☒ No
7. Provide an EQ-related justification for continued operation (as required per PLP-02, Section 4.4.3.3 or 4.4.4)?
☐ Yes ☒ No
8. Provide the resolution of a qualification problem (as required per PLP-02, Section 4.4.4)?
☐ Yes ☒ No

- NOTES:
1. If all no, then no further EQ consideration is required. Mark the EER Traveler accordingly as required by ENP-12 and include this completed EER-EQIF within the EER package. An EQ Technical Review is not required.
 2. If any yes, an EQ impact assessment (per Section 5.3) must be performed during the evaluation process. Mark the EER Traveler accordingly and include this completed EER-EQIF within the EER package. An EQ technical review is required.

DATA SHEET 1

CONTROL ROOM

STEP NO.	TIME	CANAL TEMP COMP POINT C382	CANAL LEVEL 1-SW-PI IR-285	NUC HDR PRESS 1-SW-PI -143-1	CONV HDR PRESS 1-SW-PI -131-1	RHRSW A(B)-LOOP FLOW 1-E11 -FI- R602A(B)	RBCCW SW FLOW 1-SW -FI- 1158-1	VITAL HDR FLOW A-LOOP 1-SW-FI -5114	VITAL HDR FLOW B-LOOP 1-SW-FI -5115
9.3.29	1105	49.0	+2.0	62	60	3000 (R602A)	3400	550	500
9.3.33	1320	50.6	-0.2	60	60	3000 (R602B)	3300	530	490
9.3.42	1443	50.2	-1.3	54	22	3000 (R602A)	3300	530	480

* Note the operating RHRS SW LOOP (A or B) with the recorded data.

** VERIFIED WITH COMP. POINT L125

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UNIT 1
1-PT-24.6.4

DATA SHEET 2

REACTOR BUILDING EL. 50'

STEP NO.	RHR SW BSTR PUMP A MOTOR COOLER FLOW	RHR SW BSTR PUMP C MOTOR COOLER FLOW	RHR SW BSTR PUMP B MOTOR COOLER FLOW	RHR SW BSTR PUMP D MOTOR COOLER FLOW
9.3.29	67.5	66.16	N/A	N/A
9.3.33	N/A	N/A	66.5	63.6
9.3.42	N/A	N/A	65.8	63.3

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UNIT 1
1-PT-24.6.4

DATA SHEET 3

DIESEL GENERATORS
SERVICE WATER FLOWS

STEP NO.	DIESEL GENERATOR #1 JACKET WATER COOLER SW FLOW	DIESEL GENERATOR #2 JACKET WATER COOLER SW FLOW
9.3.29	1386	1422
9.3.33	1300	1428
9.3.42	1300	1392

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UNIT 1
1-PT-24.6.4

DATA SHEET 4

SERVICE WATER BUILDING

STEP NO.	NSW PUMP 1A FLOW	NSW PUMP 1B FLOW	LUBE WATER FLOW	CONV HDR PRESS TEST GAUGE #1	NUC HDR PRESS TEST GAUGE #2	NSW PMP A DISCH PRESS PI-144	NSW PMP B DISCH PRESS PI-145	NSW PMP A DISCH STRN ΔP PDIC-138	NSW PMP B DISCH STRN ΔP PDIC-140	PI-131-2	PI-132-2	PI-133-2	PI-134-2
9.3.29	5664.0	4601.25	128.5	57.4	61.2	57	58	1.5	2.0	60	64		
9.3.33	9387.0	4668.0	124.0	56.6	59.5	55	56	1.4	2.0	60	62		
9.3.42	5693.0	4810.0	127.0	*18.5	58.0	54	56	1.4	2.2	21	60		

Test Gauge #1 Data:

CP&L No. BSER G-127

Range: 0-150 psi

Installed El.: (+)6'-6"

Cal Date: 1-2-91

Cal. Due Date: 1/28/91

Test Gauge #2 Data:

CP&L No. BSER G-136

Range: 0-150 psi

Installed El.: (+)6'-6"

Cal Date: 12-21-90

Cal. Due Date: 1/21/91

X CONV. HDR PRESSURE INCREASING AS FOLLOWS:

TIME	PRES
14:19	20.2
15:00	22.0
15:07	23.0

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RHR A 100 T
RHR A 100 T
RHR C 100 T

DATA SHEET 5

REACTOR BUILDING EL. -17'

STEP NO.	RHR PUMP ROOM A CLR LOOP FLOW	RHR PUMP 1A SEAL CLR FLOW	RHR PUMP 1C SEAL CLR FLOW	VITAL HDR A LOOP PRESS TEST GUAGE #4	RHR PUMP ROOM CLR B LOOP FLOW	RHR PUMP 1B SEAL CLR FLOW	RHR PUMP 1D SEAL CLR FLOW	VITAL HDR B LOOP PRESS TEST GUAGE #3	CORE SPRAY ROOM CLR FLOW A LOOP	CORE SPRAY ROOM CLR FLOW B LOOP
9.3.29	518.6	16.71	17.12	63.0	406.16	14.87	16.66	64.0	91.2	6.2
9.3.33	499.2	16.46	15.64	61.5	402.17	14.1	16.	62.5	91.2	6.2
9.3.42	494.8	16.08	15.08	60.0	400.83	14.4	16.	61.0	90.6	6.16

Test Gauge #3 Data:

CP&L No. G-175

Range: 0-200

Installed El.: -12' 2"

Cal Date: 12/27/90

Cal. Due Date: 1/21/91

Test Gauge #4 Data:

CP&L No. G-177

Range: 0-200

Installed El.: -13' 8"

Cal Date: 1/14/91

Cal. Due Date: 2/10/91

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DATA SHEET 1

CONTROL ROOM

STEP NO.	CANAL TEMP COMP POINT C382	CANAL LEVEL COMP POINT L125	RHR SW FLOW 1-ELI -FI- R602A(B)	RBCW SW FLOW 1-SW -FI- 1156-1	VITAL HDR FLOW A-LOOP 1-SW-FI -5114	VITAL HDR FLOW B-LOOP 1-SW-FI -5115
9.3.13	50.9	+2.35	N/A	4600	Ø	440
9.3.15	50.9	+1.97	N/A	5150	Ø	485
9.3.17	50.9	+1.07	N/A	4600	Ø	440
9.3.20	50.9	+0.44	2500 R602B	3900	Ø	380
9.3.22	50.9	+0.14	2600 R602B	3800	Ø	450
9.3.24	50.9	-0.15	2100 R602B	3850	Ø	365
9.3.29	50.9	-1.42	4450 R602B	5400	Ø	380

ALH Press = 63 PSI
C.H. Press = 70 PSI
ALH Press = 75 PSI
C.H. Press = 70 PSI

ALH Press = 69
C.H. Press = 70

ALH Press = 48
C.H. Press = 69

* Note the operating RHR SW LOOP (A or B) with the recorded data.

* C382 Loop on Pump Unit 1 & 2. EERC Remains of Canal Temp At 'SIDE FOR LIFE'
= 50.90 F @ 2100 1-30-91. REN

ALH Press @ 1500 PSI 143-1

C.H. Press @ 1500 PSI 131-1

RHR SW B Loop Pressure @ 1500 PSI 155-1 (4-1157-1 For 9.3.29)

REN 1-30-91

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DATA SHEET 2

SERVICE WATER BUILDING

STEP NO.	NSW PUMP 1A FLOW	NSW PUMP 1B FLOW	NSW PUMP 1A PRESS 1-SW-PI-144	NSW PUMP 1B PRESS 1-SW-PI-145	NSW PUMP 1A STRNR DIFF PRESS 1-SW-PDIC-138	NSW PUMP 1B STRNR DIFF PRESS 1-SW-PDIC-140	CORV HDR PRESS TEST GAUGE #1	NUC HDR PRESS TEST GAUGE #2
9.3.13	N/A	3375	N/A	58.0	N/A	2.0	48.2	61.8
9.3.15	2088	1751	48.8	67.0	0.70	1.45	69.0	74.7
9.3.17	4637	N/A	57.5	N/A	1.70	N/A	67.8	62.5
9.3.20	6688	N/A	45.0	N/A	2.80	N/A	67.2	47.6
9.3.22	4143	2571	62.0	64.0	1.80	1.90	68.2	68.0
9.3.24	N/A	4208	N/A	45.0	N/A	3.0	67.0	47.2
9.3.29	6033	2825	48.0	49.0	1.85	2.65	66.8	51.8

Test Gauge #1 Data:

CP&L No. G-136

Range: 0-150

Installed El.: 31 1/2

Cal Date: 1/24/91

Cal. Due Date: 2/18/91

Test Gauge #2 Data:

CP&L No. G-171A

Range: 0-150

Installed El.: 31 1/2

Cal Date: 1-21-91

Cal. Due Date: 2/18/91

1A Nuclear Service Water Pump Controlotron Serial No. 00025

Transducer Set Serial No. 00025

Transducer Set Serial No. 01790 (W) + B(W) 573

1B Nuclear Service Water Pump Controlotron Serial No. 00009

Transducer Set Serial No. 00009

Transducer Set Serial No. 01794 (W) + B(W) 573

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1.6
1.9
2.2
1.2
1.7
2.4

FLOWRATE IS EXPRESSED IN GPM AND PRESSURE IN PSIG

THE DARCY WEISBACH HEAD LOSS EQUATION IS USED, THE KINEMATIC VIS. = .0000070

THE SPECIFIC GRAVITY OF THIS LIQUID = 1.03

A SUCCESSFUL GEOMETRIC VERIFICATION HAS BEEN COMPLETED

OUTPUT SELECTION: THE FOLLOWING RESULTS ARE OUTPUT
 RESULTS ARE OUTPUT FOR ALL PIPES WITH PUMPS - CLOSED PIPES ARE NOTED
 RESULTS ARE OUTPUT FOR THE FOLLOWING PIPES : 1 4 16 31 34 38 41 47 50 57 62
 72 73 74 79 88 92 97 101 105
 RESULTS ARE OUTPUT FOR THE FOLLOWING PIPES : 109 116 120 128 134 146 152 166 174 179 185
 197 198 205 213 218 224 233 234 235
 RESULTS ARE OUTPUT FOR THE FOLLOWING PIPES : 501 503 600
 RESULTS ARE OUTPUT FOR THE FOLLOWING JUNCTION NODES : 1 2 14 15 16 27 28 36 37
 49 50 66 70 74 75
 RESULTS ARE OUTPUT FOR THE FOLLOWING JUNCTION NODES : 90 91 100 101 109 110 143 144 156
 157 18 23

THIS SYSTEM HAS 243 PIPES WITH 212 JUNCTIONS , 27 LOOPS AND 5 FCNS

THE RESULTS ARE OBTAINED AFTER 5 TRIALS WITH AN ACCURACY = .00242

UICALEN2 CHANGE 0:MODEL ATTEMPTS TO MIMIC 1-PT-24.6.4 STEP 9.3.29;INCLUDES PIPE
 ROUGHNESS & ID CHANGES FROM PM 82-221A AND NEW LEAKAGE LINE ML (ASSUMES 448 GPM
 @ 34.2 PSID BETWEEN CSHW & NSWH)

PIPE NO.	NODE NOS.	FLOWRATE	HEAD LOSS	PUMP HEAD	MINOR LOSS	VELOCITY	HL/1000
1	0 1	5392.54	.02	154.04	.00	7.96	19.69
4	0 4	5330.81	.02	155.10	.00	7.87	19.24
16	12 13	131.00	.51	.00	.28	4.29	44.90
31	27 28	66.16	.04	.00	45.02	5.02	42.22
34	304 305	505.56	.82	.00	2.61	14.15	169.80
38	36 37	103.14	.10	.00	32.34	7.83	99.14
41	38 39	101.48	.10	.00	31.31	7.70	96.08
47	41 42	103.09	.10	.00	32.31	7.82	99.04
50	43 44	101.15	.10	.00	31.10	7.68	95.47
57	49 50	14.34	.20	.00	12.55	6.36	200.64
62	53 54	16.20	.25	.00	6.40	7.18	253.51
72	59 62	1151.04	.00	.00	1.63	2.20	.93
73	60 63	1117.30	.00	.00	1.54	2.13	.88
74	61 64	1131.66	.00	.00	1.58	2.16	.90
LINE 79	IS CLOSED						
88	74 75	118.78	.13	.00	15.14	9.01	130.32

ATTACHMENT C: UICALBN2 RESULTS FILE

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92	76	77	120.51	.13	.00	15.58	9.15	134.01
97	81	82	122.02	.14	.00	15.98	9.26	137.28
101	83	84	117.78	.13	.00	14.89	8.94	128.19
105	88	68	603.88	1.81	.00	7.24	6.69	22.54
109	90	91	16.73	.27	.00	.85	7.42	269.84
116	96	97	16.69	.27	.00	2.55	7.40	268.70
120	100	101	91.36	.08	.00	2.99	6.93	78.44
128	109	110	1402.42	.04	.00	14.65	10.24	39.87
134	115	116	1340.97	.04	.00	2.98	9.79	36.54
LINE 146	IS	CLOSED						
LINE 152	IS	CLOSED						
LINE 166	IS	CLOSED						
LINE 174	IS	CLOSED						
LINE 179	IS	CLOSED						
LINE 185	IS	CLOSED						
197	170	171	.00	.00	.00	.00	.00	.00
198	302	165	.00	.00	.00	.00	.00	.00
205	177	178	1498.63	.03	749.29	.00	9.61	32.61
213	185	186	1501.37	.03	749.19	.00	9.63	32.73
218	189	190	66.98	9.68	.00	5.11	13.96	572.79
224	195	196	67.29	9.48	.00	5.16	14.02	577.99
233	203	204	3000.00	.01	.00	.00	5.27	4.69
LINE 234	IS	CLOSED						
235	70	205	3400.00	.00	.00	.27	5.97	5.96
501	86	301	479.10	.03	.00	65.70	5.31	14.44
503	46	303	408.86	.06	.00	68.03	4.53	10.66
600	17	0	205.26	.00	.00	16.12	.24	.02

JUNCTION	NUMBER	DEMAND	GRADE LINE	ELEVATION	PRESSURE
1		.00	176.02	43.10	59.33
2		.00	171.81	42.40	57.76
14		.00	169.82	26.50	63.97
15		.00	171.20	26.50	64.59
16		.00	171.20	26.50	64.59
18		.00	167.18	36.30	58.42
23		.00	158.24	12.50	65.05
27		.00	144.83	11.00	59.73
28		.00	99.77	10.80	39.71
36		.00	155.27	17.50	61.49
37		.00	122.83	17.50	47.01
49		.00	147.76	8.30	62.24
50		.00	135.01	8.30	56.55
66		3400.00	161.12	77.20	37.45
70		-3400.00	42.67	74.10	14.03
74		.00	148.97	17.50	58.68
75		.00	133.70	17.50	51.86
90		.00	137.53	31.60	47.28
91		.00	136.40	31.60	46.78
100		.00	130.10	11.40	52.98
101		.00	127.03	28.50	43.98
109		.00	100.43	44.40	25.01
110		.00	85.75	44.40	18.45
143		.00	166.84	72.80	41.97
144		.00	40.40	74.20	-15.09
156		.00	166.81	72.80	41.96

ATTACHMENT C: VICALBN2 RESULTS FILE

157 .00 40.40 74.20 -15.09

THE NET SYSTEM DEMAND = 131.00

SUMMARY OF INFLOWS(+) AND OUTFLOWS(-) FROM FIXED GRADE NODES

PIPE NUMBER	FLOWRATE
1	5392.54
4	5330.81
158	-2743.39
161	-7643.71
600	-205.26

THE NET FLOW INTO THE SYSTEM FROM FIXED GRADE NODES = 10723.36

THE NET FLOW OUT OF THE SYSTEM INTO FIXED GRADE NODES = -10592.36

A SUMMARY OF CONDITIONS SPECIFIED FOR THE NEXT SIMULATION FOLLOWS

THE FOLLOWING SPECIFIC DEMAND CHANGES ARE MADE :

JUNCTION NUMBER	DEMAND
13	124.00
66	3300.00
70	-3300.00
204	.00
205	.00
302	3000.00
165	-3000.00

LINE 166 IS OPEN
 LINE 174 IS OPEN
 LINE 179 IS OPEN
 LINE 185 IS OPEN
 LINE 198 IS CLOSED
 LINE 205 IS CLOSED
 LINE 213 IS CLOSED
 LINE 218 IS CLOSED
 LINE 224 IS CLOSED
 LINE 234 IS OPEN

THE FOLLOWING CHANGES IN PIPE DATA ARE SPECIFIED

FOR PIPE NUMBER 1 THE VALUE OF THE FIXED GRADE IS CHANGED TO 19.8
 FOR PIPE NUMBER 4 THE VALUE OF THE FIXED GRADE IS CHANGED TO 19.8
 FOR PIPE NUMBER 600 THE VALUE OF THE FIXED GRADE IS CHANGED TO 153.3

PIPE NO.	NODE NOS.	LENGTH	DIAMETER	ROUGHNESS	MINOR LOSS K	FIXED GRADE
2	1 2	9.7	16.6	5.0	3.97	.00
5	4 5	9.7	16.6	5.0	5.40	.00

THE RESULTS ARE OBTAINED AFTER 5 TRIALS WITH AN ACCURACY = .00353

UICALBN2 CHANGE 1:PT-24.6.4 STEP 9.3.33

PIPE NO.	NODE NOS.	FLOWRATE	HEAD LOSS	PUMP HEAD	MINOR LOSS	VELOCITY	HL/1000
1	0 1	5329.08	.02	155.13	.00	7.87	19.23
4	0 4	5259.77	.02	156.30	.00	7.77	18.73
16	12 13	124.00	.45	.00	.25	4.06	40.25
31	27 28	65.68	.04	.00	44.36	4.98	41.63
34	304 305	501.85	.80	.00	2.57	14.05	167.36
38	36 37	102.38	.10	.00	31.87	7.77	97.74
41	38 39	100.74	.09	.00	30.85	7.65	94.73
47	41 42	102.33	.10	.00	31.84	7.77	97.64
50	43 44	100.40	.09	.00	30.65	7.62	94.12
57	49 50	14.24	.20	.00	12.36	6.31	197.82
62	53 54	16.08	.25	.00	6.31	7.13	249.94

ATTACHMENT C: UICALBN2 RESULTS FILE

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72	59	62	1117.18	.00	.00	1.54	2.13	.88
73	60	63	1084.43	.00	.00	1.45	2.07	.83
74	61	64	1098.39	.00	.00	1.49	2.10	.85
LINE 79	IS	CLOSED						
88	74	75	118.53	.13	.00	15.08	9.00	129.77
92	76	77	120.25	.13	.00	15.52	9.13	133.45
97	81	82	121.75	.14	.00	15.91	9.24	136.71
101	83	84	117.53	.13	.00	14.82	8.92	127.66
105	88	68	602.57	1.80	.00	7.21	6.68	22.44
109	90	91	16.69	.27	.00	.85	7.40	268.72
116	96	97	16.66	.27	.00	2.54	7.38	267.58
120	100	101	91.16	.08	.00	2.97	6.92	78.12
128	109	110	1398.26	.04	.00	14.56	10.21	39.64
134	115	116	1336.99	.04	.00	2.96	9.76	36.33
LINE 146	IS	CLOSED						
LINE 152	IS	CLOSED						
166	143	144	1501.69	.03	749.18	.00	9.63	32.74
174	156	157	1498.31	.03	749.30	.00	9.61	32.60
179	148	149	64.74	9.22	.00	4.78	13.49	535.94
185	160	161	58.01	7.44	.00	3.84	12.09	432.69
197	170	171	3000.00	.02	.00	.21	5.27	4.69
LINE 198	IS	CLOSED						
LINE 205	IS	CLOSED						
LINE 213	IS	CLOSED						
LINE 218	IS	CLOSED						
LINE 224	IS	CLOSED						
233	203	204	.00	.00	.00	.00	.00	.00
234	204	205	.00	.00	.00	.00	.00	.00
235	70	205	3300.00	.00	.00	.25	5.80	5.63
501	86	301	478.06	.03	.00	65.42	5.30	14.38
503	46	303	405.86	.06	.00	67.03	4.50	10.51
600	17	0	202.43	.00	.00	15.68	.24	.02

JUNCTION NUMBER	DEMAND	GRADE LINE	ELEVATION	PRESSURE
1	.00	174.91	43.10	58.83
2	.00	170.90	42.40	57.36
14	.00	168.96	26.50	63.58
15	.00	168.96	26.50	63.58
16	.00	168.96	26.50	63.58
18	.00	166.39	36.30	58.07
23	.00	157.54	12.50	64.73
27	.00	144.31	11.00	59.50
28	.00	99.91	10.80	39.77
36	.00	154.60	17.50	61.19
37	.00	122.64	17.50	46.93
49	.00	147.20	8.30	62.00
50	.00	134.64	8.30	56.39
66	3300.00	160.67	77.20	37.26
70	-3300.00	41.16	74.10	-14.70
74	.00	148.30	17.50	58.38
75	.00	133.09	17.50	51.59
90	.00	136.90	31.60	47.00
91	.00	135.79	31.60	46.50
100	.00	129.50	11.40	52.71
101	.00	126.45	28.50	43.72

ATTACHMENT C: U1CALBN2 RESULTS FILE

109	.00	100.01	44.40	24.82
110	.00	85.41	44.40	18.30
143	.00	165.26	72.80	41.27
144	.00	914.41	74.20	375.01
156	.00	165.24	72.80	41.26
157	.00	914.50	74.20	375.06

THE NET SYSTEM DEMAND = 124.00

SUMMARY OF INFLOWS(+) AND OUTFLOWS(-) FROM FIXED GRADE NODES

PIPE NUMBER	FLOWRATE
1	5329.08
4	5259.77
158	-2735.26
161	-7527.18
600	-202.43

THE NET FLOW INTO THE SYSTEM FROM FIXED GRADE NODES = 10588.86

THE NET FLOW OUT OF THE SYSTEM INTO FIXED GRADE NODES = -10464.86

A SUMMARY OF CONDITIONS SPECIFIED FOR THE NEXT SIMULATION FOLLOWS

THE FOLLOWING SPECIFIC DEMAND CHANGES ARE MADE :

JUNCTION NUMBER	DEMAND
66	3300.00
70	-3300.00
13	127.00
302	3000.00
165	-3000.00
204	.00
205	.00

THE FOLLOWING CHANGES IN PIPE DATA ARE SPECIFIED

FOR PIPE NUMBER 1 THE VALUE OF THE FIXED GRADE IS CHANGED TO 18.7

FOR PIPE NUMBER 4 THE VALUE OF THE FIXED GRADE IS CHANGED TO 18.7

FOR PIPE NUMBER 600 THE VALUE OF THE FIXED GRADE IS CHANGED TO 79.8

PIPE NO.	NODE NOS.	LENGTH	DIAMETER	ROUGHNESS	MINOR LOSS K	FIXED GRADE
2	1 2	9.7	16.6	5.0	3.84	.00
5	4 5	9.7	16.6	5.0	5.67	.00

THE RESULTS ARE OBTAINED AFTER 3 TRIALS WITH AN ACCURACY = .00092

UICALBN2 CHANGE 2:PT-24.6.4 STEP 9.3.42

PIPE NO.	NODE NOS.	FLOWRATE	HEAD LOSS	PUMP HEAD	MINOR LOSS	VELOCITY	HL/1000
1	0 1	5449.34	.02	153.06	.00	8.05	20.10
4	0 4	5358.71	.02	154.62	.00	7.91	19.44
16	12 13	127.00	.48	.00	.27	4.16	42.21
31	27 28	64.81	.04	.00	43.19	4.92	40.58
34	304 305	495.20	.78	.00	2.51	13.86	163.05
38	36 37	101.03	.10	.00	31.03	7.67	95.26
41	38 39	99.40	.09	.00	30.04	7.54	92.32
47	41 42	100.98	.10	.00	31.00	7.66	95.16
50	43 44	99.07	.09	.00	29.84	7.52	91.73
57	49 50	14.05	.19	.00	12.04	6.23	192.82
62	53 54	15.86	.24	.00	6.14	7.03	243.59
72	59 62	1117.18	.00	.00	1.54	2.13	.88
73	60 63	1084.43	.00	.00	1.45	2.07	.83
74	61 64	1098.39	.00	.00	1.49	2.10	.85
LINE 79	IS CLOSED						
88	74 75	116.96	.13	.00	14.68	8.88	126.47
92	76 77	118.66	.13	.00	15.11	9.01	130.05
97	81 82	120.15	.13	.00	15.49	9.12	133.23
101	83 84	115.98	.12	.00	14.43	8.80	124.41
105	88 68	594.61	1.75	.00	7.02	6.59	21.88
109	90 91	16.47	.26	.00	.83	7.30	261.90

ATTACHMENT C: UICALBN2 RESULTS FILE

116	96	97	16.44	.26	.00	2.47	7.29	260.79
120	100	101	89.96	.08	.00	2.89	6.83	76.14
128	109	110	1381.51	.04	.00	14.21	10.09	38.72
134	115	116	1320.97	.04	.00	2.89	9.64	35.49
LINE 146	IS	CLOSED						
LINE 152	IS	CLOSED						
166	143	144	1501.70	.03	749.18	.00	9.63	32.74
174	156	157	1498.30	.03	749.30	.00	9.61	32.60
179	148	149	57.88	7.41	.00	3.82	12.06	430.68
185	160	161	56.73	7.12	.00	3.67	11.82	414.24
197	170	171	3000.00	.02	.00	.21	5.27	4.69
LINE 198	IS	CLOSED						
LINE 205	IS	CLOSED						
LINE 213	IS	CLOSED						
LINE 218	IS	CLOSED						
LINE 224	IS	CLOSED						
233	203	204	.00	.00	.00	.00	.00	.00
234	204	205	.00	.00	.00	.00	.00	.00
235	70	205	3300.00	.00	.00	.25	5.80	5.63
501	86	301	471.75	.03	.00	63.70	5.23	14.02
503	46	303	400.48	.06	.00	65.27	4.44	10.24
600	17	0	474.16	.00	.00	86.03	.56	.09

JUNCTION	NUMBER	DEMAND	GRADE LINE	ELEVATION	PRESSURE
1		.00	171.74	43.10	57.41
2		.00	167.68	42.40	55.92
14		.00	165.64	26.50	62.10
15		.00	165.83	26.50	62.19
16		.00	165.83	26.50	62.19
18		.00	163.10	36.30	56.60
23		.00	154.48	12.50	63.37
27		.00	141.59	11.00	58.29
28		.00	98.37	10.80	39.08
36		.00	151.62	17.50	59.86
37		.00	120.49	17.50	45.97
49		.00	144.41	8.30	60.75
50		.00	132.18	8.30	55.29
66	3300.00		157.38	77.20	35.79
70	-3300.00		41.16	74.10	-14.70
74	.00		145.48	17.50	57.12
75	.00		130.67	17.50	50.51
90	.00		134.38	31.60	45.87
91	.00		133.29	31.60	45.39
100	.00		127.17	11.40	51.67
101	.00		124.20	28.50	42.71
109	.00		98.32	44.40	24.07
110	.00		84.07	44.40	17.70
143	.00		161.97	72.80	39.80
144	.00		911.12	74.20	373.55
156	.00		161.95	72.80	39.79
157	.00		911.22	74.20	373.59

THE NET SYSTEM DEMAND = 127.00

SUMMARY OF INFLOWS(+) AND OUTFLOWS(-) FROM FIXED GRADE NODES

ATTACHMENT C: UICALBN2 RESULTS FILE

PIPE NUMBER	FLOWRATE
1	5449.34
4	5358.71
158	-2702.48
161	-7504.42
600	-474.16

THE NET FLOW INTO THE SYSTEM FROM FIXED GRADE NODES = 10808.05
THE NET FLOW OUT OF THE SYSTEM INTO FIXED GRADE NODES = -10681.05

FLOWRATE IS EXPRESSED IN GPM AND PRESSURE IN PSIG

A SUMMARY OF THE ORIGINAL DATA FOLLOWS

THE DARCY WEISBACH HEAD LOSS EQUATION IS USED, THE KINEMATIC VIS. = .0000070

THE SPECIFIC GRAVITY OF THIS LIQUID = 1.03

PIPE NO.	NODE NOS.	LENGTH (FEET)	DIAMETER (INCHES)	ROUGHNESS	MINOR LOSS K	FIXED GRADE
1	0 1	1.0	16.6	5.0	.00	22.00
LINE 1	PUMP DATA (HEAD-FLOW):	200.0		.0	135.0 6400.0	90.0 8300.0
2	1 2	9.7	16.6	5.0	4.08	
3	2 3	15.9	18.6	5.0	2.91	
4	0 4	1.0	16.6	5.0	.00	22.00
LINE 4	PUMP DATA (HEAD-FLOW):	200.0		.0	135.0 6400.0	90.0 8300.0
5	4 5	9.7	16.6	5.0	5.34	
6	5 6	15.9	18.6	5.0	2.91	
7	3 6	6.0	28.5	5.0	.06	
8	6 7	6.0	28.5	5.0	.06	
9	7 8	308.8	28.5	5.0	.48	
10	8 18	371.0	28.5	5.0	.84	
11	8 9	2.7	16.6	5.0	.33	
12	9 10	63.7	17.3	.2	.60	
13	10 103	124.3	16.6	5.0	.52	
14	7 11	1.4	3.5	5.0	.71	
15	11 12	3.8	3.5	5.0	3.69	
16	12 13	11.3	3.5	5.0	.99	
17	14 3	7.0	28.5	5.0	.06	
18	15 14	6.1	28.5	5.0	.06	
19	16 15	7.0	28.5	5.0	.06	
20	17 16	2.3	28.5	5.0	.00	
21	306 19	2.3	29.3	.2	.07	
22	19 21	9.1	22.5	5.0	.79	
23	19 20	11.4	29.3	.2	1.49	
24	20 55	24.1	19.3	.2	.68	
25	18 22	28.1	6.1	.2	2.76	
26	22 23	15.5	6.1	.2	.30	
27	23 24	6.5	6.1	.2	.18	
28	24 25	111.6	6.1	.2	2.63	
29	25 26	67.3	3.8	.2	.22	
30	26 27	40.8	1.7	.2	3.46	
31	27 28	1.0	2.3	.2	115.00	
32	28 29	31.5	1.7	.2	33.18	
33	29 30	1.2	3.8	.2	17.02	
34	304 305	4.8	3.8	.2	.84	
35	23 32	13.1	6.1	.2	.81	

ATTACHMENT D: UICALBN2 INPUT DATA FILE

36	33	34	1.3	3.0	.2	.54
37	34	36	8.2	2.3	.2	.74
38	36	37	1.0	2.3	.2	34.00
39	37	40	7.0	2.3	.2	1.13
40	34	38	7.2	2.3	.2	1.17
41	38	39	1.0	2.3	.2	34.00
42	39	40	7.1	2.3	.2	2.03
43	40	45	5.0	3.0	.2	.69
44	32	33	5.0	6.1	.2	.48
45	33	35	2.8	3.0	.2	.79
46	35	41	9.2	2.3	.2	.74
47	41	42	1.0	2.3	.2	34.00
48	42	45	7.0	2.3	.2	2.06
49	35	43	7.9	2.3	.2	1.76
50	43	44	1.0	2.3	.2	34.00
51	44	46	8.0	2.3	.2	2.60
52	45	40	1.5	6.1	.2	.12
53	303	47	20.8	6.1	.2	.93
54	47	30	200.0	6.1	.2	3.33
55	24	48	5.5	1.4	.2	.85
56	48	49	11.0	1.0	.2	11.64
57	49	50	1.0	1.0	.2	20.00
58	50	51	17.2	1.0	.2	125.00
59	51	52	1.1	1.4	.2	.90
60	52	47	2.9	1.4	.2	1.73
61	48	53	19.0	1.0	.2	12.94
62	53	54	1.0	1.0	.2	8.00
63	54	51	9.0	1.0	.2	100.00
64	31	139	47.4	18.6	5.0	.08
65	22	71	125.1	6.1	.2	3.02
66	55	56	104.2	18.6	5.0	12.71
67	56	57	14.9	18.6	5.0	.60
68	57	58	5.0	18.6	5.0	.30
69	57	59	16.1	14.6	5.0	.67
70	58	60	16.1	12.6	5.0	.47
71	58	61	18.3	14.6	5.0	1.02
72	59	62	1.0	14.6	.2	21.80
73	60	63	1.0	14.6	.2	21.80
74	61	64	1.0	14.6	.2	21.80
75	62	65	12.5	15.3	.2	.51
76	63	65	10.9	13.3	.2	.37
77	64	66	13.3	15.3	.2	.87
78	65	66	5.7	15.3	.2	.08
79	66	70	29.5	15.3	.2	17.59
LINE 79	IS	CLOSED				
80	205	69	9.3	15.3	.2	.62
81	69	68	30.2	28.5	5.0	1.82
82	68	137	36.9	28.5	5.0	.04
83	71	98	51.2	6.1	.2	2.85
84	98	67	2.9	6.1	.2	.63
85	71	72	8.2	6.1	.2	.36
86	72	300	37.1	6.1	.2	1.17
87	73	74	9.8	2.3	.2	1.35
88	74	75	1.0	2.3	.2	12.00
89	75	78	7.2	2.3	.2	1.76
90	73	79	.9	6.1	.2	.12
91	79	76	8.5	2.3	.2	1.08

ATTACHMENT D: UICALBN2 INPUT DATA FILE

92	76	77	1.0	2.3	.2	12.00
93	77	78	8.6	2.3	.2	1.51
94	78	85	4.7	3.0	.2	.57
95	79	80	1.2	3.0	.2	1.13
96	80	81	9.1	2.3	.2	1.01
97	81	82	1.0	2.3	.2	12.00
98	82	85	7.5	2.3	.2	.81
99	85	86	4.2	6.1	.2	.42
100	80	83	9.2	2.3	.2	1.35
101	83	84	1.0	2.3	.2	12.00
102	84	86	8.4	2.3	.2	1.62
103	301	87	27.5	6.1	.2	1.17
104	87	88	606.1	6.1	.2	4.82
105	88	68	80.2	6.1	.2	10.40
106	72	102	12.5	1.7	.2	.60
107	102	89	2.9	1.4	.2	.73
108	89	90	13.0	1.0	.2	12.28
109	90	91	1.0	1.0	.2	1.00
110	91	92	24.0	1.0	.2	75.00
111	92	93	.9	1.4	.2	.22
112	93	94	2.9	1.4	.2	1.35
113	94	95	18.7	1.7	.2	1.20
114	95	87	.9	1.7	.2	1.67
115	89	96	20.3	1.0	.2	12.46
116	96	97	1.0	1.0	.2	3.00
117	97	92	11.2	1.0	.2	75.00
118	98	99	101.9	3.8	.2	1.46
119	99	100	35.0	1.7	.2	3.57
120	100	101	1.0	2.3	.2	4.00
121	101	88	34.5	2.3	.2	100.00
122	120	104	31.0	16.6	5.0	.89
123	104	105	5.4	16.6	5.0	.89
124	105	106	.8	16.6	5.0	.00
125	104	107	56.3	5.6	5.0	4.01
126	107	108	12.7	5.6	5.0	.73
127	108	109	1.9	7.5	5.0	.76
128	109	110	1.0	7.5	.2	9.00
129	110	111	1.9	7.5	5.0	.98
130	111	112	79.0	5.6	5.0	3.28
131	105	113	79.8	5.6	5.0	4.34
132	113	114	12.0	5.6	5.0	.73
133	114	115	1.9	7.5	5.0	.76
134	115	116	1.0	7.5	.2	2.00
135	116	117	1.9	7.5	5.0	.98
136	117	118	100.4	5.6	5.0	3.61
137	119	118	.8	16.6	5.0	.00
138	118	112	.8	16.6	5.0	.07
139	112	136	26.8	16.6	5.0	.45
140	103	120	18.9	16.6	5.0	35.41
141	103	121	12.0	16.6	5.0	35.41
142	121	122	3.1	5.6	5.0	.00
143	120	123	58.0	5.6	5.0	4.00
144	123	124	13.7	5.6	5.0	.73
145	124	125	1.7	7.5	5.0	.76
146	125	126	1.0	8.0	.2	9.00
LINE 146	IS CLOSED					
147	126	127	1.9	7.5	5.0	1.48

ATTACHMENT D: UICALBN2 INPUT DATA FILE

148	127	128	74.8	5.6	5.0	2.68	
149	121	129	54.5	5.6	5.0	4.01	
150	129	130	16.3	5.6	5.0	.91	
151	130	131	1.7	7.5	5.0	.50	
152	131	132	1.0	8.0	.2	9.00	
LINE 152 IS CLOSED							
153	132	133	1.9	7.5	5.0	.98	
154	133	134	75.7	5.6	5.0	3.28	
155	135	134	2.3	16.6	5.0	.00	
156	134	128	30.8	16.6	5.0	.07	
157	128	136	4.3	16.6	5.0	.45	
158	136	0	414.1	16.6	5.0	.96	28.90
159	137	138	16.4	28.5	5.0	.92	
160	139	138	126.7	18.6	5.0	.64	
161	138	0	286.2	34.5	5.0	1.13	40.00
162	21	140	27.2	22.5	5.0	.20	
163	140	141	6.5	12.6	5.0	.34	
164	141	142	4.3	12.6	5.0	.12	
165	142	143	4.3	8.0	.2	.32	
166	143	144	1.0	8.0	.2	.00	
LINE 166 PUMP DATA (HEAD-FLOW): 775.0 .0 580.0 4000.0 500.0 4725.0							
LINE 166 IS CLOSED							
167	144	145	9.9	12.0	.2	3.76	
168	145	146	16.7	12.0	.2	.93	
169	140	153	16.0	22.5	5.0	.06	
170	153	173	21.5	22.5	5.0	.30	
171	153	154	6.5	12.6	5.0	.44	
172	154	155	4.3	12.6	5.0	.12	
173	155	156	4.3	8.0	.2	.32	
174	156	157	1.0	8.0	.2	.00	
LINE 174 PUMP DATA (HEAD-FLOW): 775.0 .0 580.0 4000.0 500.0 4725.0							
LINE 174 IS CLOSED							
175	157	158	9.8	12.0	.2	3.76	
176	158	146	31.4	12.0	.2	1.07	
177	141	147	.8	1.7	.2	.20	
178	147	148	.5	1.7	.2	.07	
179	148	149	17.2	1.4	.2	1.69	
LINE 179 IS CLOSED							
180	149	150	.7	1.7	.2	26.27	
181	150	151	2.2	1.4	.2	27.12	
182	151	152	19.9	1.4	.2	2.42	
183	154	159	.8	1.7	5.0	.69	
184	159	160	.5	1.7	.2	.07	
185	160	161	17.2	1.4	.2	1.69	
LINE 185 IS CLOSED							
186	161	162	1.0	1.7	.2	26.57	
187	162	163	2.7	1.4	.2	28.70	
188	163	164	19.9	1.4	.2	2.21	
189	193	164	21.2	3.0	.2	.32	
190	164	152	16.7	3.0	.2	.54	
191	152	165	117.8	3.0	.2	4.45	
192	146	166	156.0	16.0	.2	1.15	
193	166	167	18.7	16.0	.2	.44	
194	167	168	10.5	15.3	.2	.14	
195	168	169	2.5	15.3	.2	.00	
196	169	170	1.0	19.3	.2	11.50	
197	170	171	5.0	15.3	.2	.48	

ATTACHMENT D: UICALBN2 INPUT DATA FILE

198	302	165	205.0	15.3	.2	410.00		
199	165	172	7.5	19.3	.2	.00		
200	172	31	31.0	18.6	5.0	.07		
201	173	174	1.0	12.6	5.0	.00		
202	174	175	4.7	13.3	.2	.10		
203	175	176	4.3	13.3	.2	.12		
204	176	177	4.2	8.0	.2	.32		
205	177	178	1.0	8.0	.2	.00		
LINE 205	PUMP DATA (HEAD-FLOW):		775.0		.0	580.0	4000.0	500.0 4725.0
206	178	179	9.8	12.0	.2	3.76		
207	179	180	27.9	12.0	.2	.46		
208	173	181	16.0	22.5	5.0	.12		
209	181	182	.4	12.6	5.0	.00		
210	182	183	4.8	13.3	.2	.00		
211	183	184	4.4	13.3	.2	.12		
212	184	185	4.2	8.0	.2	.32		
213	185	186	1.0	8.0	.2	.00		
LINE 213	PUMP DATA (HEAD-FLOW):		775.0		.0	580.0	4000.0	500.0 4725.0
214	186	187	10.4	12.0	.2	3.76		
215	187	180	17.4	12.0	.2	.29		
216	175	188	1.0	1.7	.2	.49		
217	188	189	.3	1.4	.2	.07		
218	189	190	16.9	1.4	.2	1.69		
219	190	191	1.0	1.7	.2	25.00		
220	191	192	2.3	1.4	.2	15.00		
221	192	193	19.5	1.4	.2	2.44		
222	183	194	.4	1.7	.2	.49		
223	194	195	.7	1.4	.2	.07		
224	195	196	16.4	1.4	.2	1.69		
225	196	197	1.0	1.7	.2	10.00		
226	197	198	2.9	1.4	.2	15.00		
227	198	193	39.2	1.4	.2	5.21		
228	180	199	212.5	15.3	.2	1.33		
229	199	200	2.5	15.3	.2	.25		
230	200	201	2.5	19.3	.2	.00		
231	201	202	1.0	19.3	.2	11.50		
232	202	203	2.5	19.3	.2	.19		
233	203	204	2.5	15.3	.2	.00		
234	204	205	235.1	15.3	.2	4.09		
LINE 234	IS CLOSED							
235	70	205	.7	15.3	.2	.48		
500	300	73	4.8	6.1	.2	.76		
501	86	301	2.3	6.1	.2	150.00		
502	171	302	.4	15.3	.2	.00		
503	46	303	5.8	6.1	.2	213.26		
504	30	304	1.5	3.8	.2	.00		
505	305	31	32.9	5.6	5.0	1.94		
506	18	306	103.8	28.5	5.0	.08		
600	17	0	1.0	18.6	5.0	17794.00		155.08

A SUCCESSFUL GEOMETRIC VERIFICATION HAS BEEN COMPLETED

JUNCTION NUMBER	DEMAND	ELEVATION	CONNECTING PIPES
1	.00	43.10	1 2
2	.00	42.40	2 3
3	.00	26.50	3 7 17

ATTACHMENT D: UICALBN2 INPUT DATA FILE

4	.00	43.10	4	5	
5	.00	42.40	5	6	
6	.00	26.50	6	7	8
7	.00	26.50	8	9	14
8	.00	26.50	9	10	11
9	.00	29.20	11	12	
10	.00	31.80	12	13	
11	.00	24.60	14	15	
12	.00	24.60	15	16	
13	131.00	24.60	16		
14	.00	26.50	17	18	
15	.00	26.50	18	19	
16	.00	26.50	19	20	
17	.00	26.50	20	600	
18	.00	36.30	10	25	506
19	.00	81.50	21	22	23
20	.00	81.50	23	24	
21	.00	81.50	22	162	
22	.00	19.10	25	26	65
23	.00	12.50	26	27	35
24	.00	12.50	27	28	55
25	.00	33.80	28	29	
26	.00	34.50	29	30	
27	.00	11.00	30	31	
28	.00	10.80	31	32	
29	.00	32.30	32	33	
30	.00	23.20	33	54	504
31	.00	35.50	14	200	505
32	.00	12.50	35	44	
33	.00	12.50	36	44	45
34	.00	12.50	36	37	40
35	.00	12.50	45	46	49
36	.00	17.50	37	38	
37	.00	17.50	38	39	
38	.00	17.50	40	41	
39	.00	17.50	41	42	
40	.00	14.20	39	42	43
41	.00	17.40	46	47	
42	.00	17.40	47	48	
43	.00	17.40	49	50	
44	.00	17.40	50	51	
45	.00	14.20	43	48	52
46	.00	14.20	51	52	503
47	.00	10.80	53	54	60
48	.00	12.50	55	56	61
49	.00	8.30	56	57	
50	.00	8.30	57	58	
51	.00	10.80	58	59	63
52	.00	10.80	59	60	
53	.00	8.30	61	62	
54	.00	8.30	62	63	
55	.00	81.50	24	66	
56	.00	81.50	66	67	
57	.00	79.00	67	68	69
58	.00	79.00	68	70	71
59	.00	74.80	69	72	
60	.00	74.80	70	73	

ATTACHMENT D: U1CALBN2 INPUT DATA FILE

61	.00	74.80	71	74	
62	.00	74.80	72	75	
63	.00	74.80	73	76	
64	.00	74.80	74	77	
65	.00	77.20	75	76	78
66	3400.00	77.20	77	78	79
67	.00	16.80	84		
68	.00	35.50	81	82	105
69	.00	65.80	80	81	
70	-3400.00	74.10	79	235	
71	.00	.10	65	83	85
72	.00	.10	85	86	106
73	.00	16.10	87	90	500
74	.00	17.50	87	88	
75	.00	17.50	88	89	
76	.00	17.50	91	92	
77	.00	17.50	92	93	
78	.00	14.20	89	93	94
79	.00	16.10	90	91	95
80	.00	16.10	95	96	100
81	.00	17.40	96	97	
82	.00	17.60	97	98	
83	.00	17.40	100	101	
84	.00	17.60	101	102	
85	.00	14.20	94	98	99
86	.00	14.20	99	102	501
87	.00	20.90	103	104	114
88	.00	33.20	104	105	121
89	.00	14.20	107	108	115
90	.00	31.60	108	109	
91	.00	31.60	109	110	
92	.00	12.10	110	111	117
93	.00	12.10	111	112	
94	.00	23.00	112	113	
95	.00	21.00	113	114	
96	.00	8.30	115	116	
97	.00	8.30	116	117	
98	.00	16.80	83	84	118
99	.00	34.50	118	119	
100	.00	11.40	119	120	
101	.00	28.50	120	121	
102	.00	14.20	106	107	
103	.00	34.50	13	140	141
104	.00	34.50	122	123	125
105	.00	34.50	123	124	131
106	.00	34.50	124		
107	.00	43.80	125	126	
108	.00	42.90	126	127	
109	.00	44.40	127	128	
110	.00	44.40	128	129	
111	.00	44.50	129	130	
112	.00	34.50	130	138	139
113	.00	43.80	131	132	
114	.00	42.90	132	133	
115	.00	44.40	133	134	
116	.00	44.40	134	135	
117	.00	44.30	135	136	

ATTACHMENT D: UICALBN2 INPUT DATA FILE

118	.00	34.50	136	137	138
119	.00	34.50	137		
120	.00	34.50	122	140	143
121	.00	34.50	141	142	149
122	.00	34.50	142		
123	.00	47.30	143	144	
124	.00	43.80	144	145	
125	.00	44.40	145	146	
126	.00	44.40	146	147	
127	.00	43.80	147	148	
128	.00	34.50	148	156	157
129	.00	43.80	149	150	
130	.00	43.80	150	151	
131	.00	44.40	151	152	
132	.00	44.40	152	153	
133	.00	43.80	153	154	
134	.00	34.50	154	155	156
135	.00	34.50	155		
136	.00	34.50	139	157	158
137	.00	19.30	82	159	
138	.00	19.30	159	160	161
139	.00	19.30	64	160	
140	.00	81.50	162	163	169
141	.00	75.00	163	164	177
142	.00	72.80	164	165	
143	.00	72.80	165	166	
144	.00	74.20	166	167	
145	.00	77.50	167	168	
146	.00	81.20	168	176	192
147	.00	75.00	177	178	
148	.00	75.00	178	179	
149	.00	73.80	179	180	
150	.00	73.90	180	181	
151	.00	74.30	181	182	
152	.00	63.50	182	190	191
153	.00	81.50	169	170	171
154	.00	75.00	171	172	183
155	.00	72.80	172	173	
156	.00	72.80	173	174	
157	.00	74.20	174	175	
158	.00	77.50	175	176	
159	.00	75.00	183	184	
160	.00	75.00	184	185	
161	.00	73.80	185	186	
162	.00	73.90	186	187	
163	.00	74.30	187	188	
164	.00	63.50	188	189	190
165	.00	58.80	191	198	199
166	.00	46.80	192	193	
167	.00	34.20	193	194	
168	.00	34.20	194	195	
169	.00	34.20	195	196	
170	.00	34.20	196	197	
171	.00	34.20	197	502	
172	.00	51.00	199	200	
173	.00	81.50	170	201	208
174	.00	79.60	201	202	

ATTACHMENT D: UICALBN2 INPUT DATA FILE

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175	.00	75.00	202	203	216
176	.00	72.80	203	204	
177	.00	72.80	204	205	
178	.00	74.10	205	206	
179	.00	77.50	206	207	
180	.00	77.50	207	215	228
181	.00	81.50	208	209	
182	.00	79.80	209	210	
183	.00	75.00	210	211	222
184	.00	72.80	211	212	
185	.00	72.80	212	213	
186	.00	74.10	213	214	
187	.00	77.50	214	215	
188	.00	75.00	216	217	
189	.00	75.00	217	218	
190	.00	73.40	218	219	
191	.00	73.40	219	220	
192	.00	74.30	220	221	
193	.00	63.50	189	221	227
194	.00	75.00	222	223	
195	.00	75.00	223	224	
196	.00	73.40	224	225	
197	.00	73.40	225	226	
198	.00	74.08	226	227	
199	.00	33.10	228	229	
200	.00	33.10	229	230	
201	.00	33.10	230	231	
202	.00	33.10	231	232	
203	.00	33.10	232	233	
204	3000.00	33.10	233	234	
205	-3000.00	71.90	80	234	235
300	.00	16.00	86	500	
301	.00	14.20	103	501	
302	.00	34.20	198	502	
303	.00	12.50	53	503	
304	.00	33.20	34	504	
305	.00	33.20	34	505	
306	.00	81.50	21	506	

OUTPUT SELECTION: THE FOLLOWING RESULTS ARE OUTPUT
 RESULTS ARE OUTPUT FOR ALL PIPES WITH PUMPS - CLOSED PIPES ARE NOTED
 RESULTS ARE OUTPUT FOR THE FOLLOWING PIPES : 1 4 16 31 34 38 41 47 50 57 62
 72 73 74 79 88 92 97 101 105
 RESULTS ARE OUTPUT FOR THE FOLLOWING PIPES : 109 116 120 128 134 146 152 166 174 179 185
 197 198 205 213 218 224 233 234 235
 RESULTS ARE OUTPUT FOR THE FOLLOWING PIPES : 501 503 600
 RESULTS ARE OUTPUT FOR THE FOLLOWING JUNCTION NODES : 1 2 14 15 16 27 28 36 37
 49 50 66 70 74 75
 RESULTS ARE OUTPUT FOR THE FOLLOWING JUNCTION NODES : 90 91 100 101 109 110 143 144 156
 157 18 23

THIS SYSTEM HAS 243 PIPES WITH 212 JUNCTIONS , 27 LOOPS AND 5 FGNS

TERMINATION DUE EITHER TO THE DETECTION OF AN ERROR OR USER INSTRUCTIONS

A SUMMARY OF CONDITIONS SPECIFIED FOR THE NEXT SIMULATION FOLLOWS

THE FOLLOWING SPECIFIC DEMAND CHANGES ARE MADE :

JUNCTION NUMBER	DEMAND
13	124.00
66	3300.00
70	-3300.00
204	.00
205	.00
302	3000.00
165	-3000.00

LINE 166 IS OPEN
LINE 174 IS OPEN
LINE 179 IS OPEN
LINE 185 IS OPEN
LINE 198 IS CLOSED
LINE 205 IS CLOSED
LINE 213 IS CLOSED
LINE 218 IS CLOSED
LINE 224 IS CLOSED
LINE 234 IS OPEN

THE FOLLOWING CHANGES IN PIPE DATA ARE SPECIFIED

FOR PIPE NUMBER 1 THE VALUE OF THE FIXED GRADE IS CHANGED TO 19.8

FOR PIPE NUMBER 4 THE VALUE OF THE FIXED GRADE IS CHANGED TO 19.8

FOR PIPE NUMBER 600 THE VALUE OF THE FIXED GRADE IS CHANGED TO 153.3

PIPE NO.	NODE NOS.	LENGTH	DIAMETER	ROUGHNESS	MINOR LOSS K	FIXED GRADE
2	1 2	9.7	16.6	5.0	3.97	.00
5	4 5	9.7	16.6	5.0	5.40	.00

A SUMMARY OF CONDITIONS SPECIFIED FOR THE NEXT SIMULATION FOLLOWS

THE FOLLOWING SPECIFIC DEMAND CHANGES ARE MADE :

JUNCTION NUMBER	DEMAND
66	3300.00
70	-3300.00
13	127.00
302	3000.00
165	-3000.00
204	.00

205

.00

THE FOLLOWING CHANGES IN PIPE DATA ARE SPECIFIED

FOR PIPE NUMBER 1 THE VALUE OF THE FIXED GRADE IS CHANGED TO 18.7

FOR PIPE NUMBER 4 THE VALUE OF THE FIXED GRADE IS CHANGED TO 18.7

FOR PIPE NUMBER 600 THE VALUE OF THE FIXED GRADE IS CHANGED TO 79.8

PIPE NO.	NODE NOS.	LENGTH	DIAMETER	ROUGHNESS	MINOR LOSS K	FIXED GRADE
2	1 2	9.7	16.6	5.0	3.84	.00
5	4 5	9.7	16.6	5.0	5.67	.00

FLOWRATE IS EXPRESSED IN GPM AND PRESSURE IN PSIG

THE DARCY WEISBACH HEAD LOSS EQUATION IS USED, THE KINEMATIC VIS. = .0000070

THE SPECIFIC GRAVITY OF THIS LIQUID = 1.03

A SUCCESSFUL GEOMETRIC VERIFICATION HAS BEEN COMPLETED

OUTPUT SELECTION: THE FOLLOWING RESULTS ARE OUTPUT
 RESULTS ARE OUTPUT FOR ALL PIPES WITH PUMPS - CLOSED PIPES ARE NOTED
 RESULTS ARE OUTPUT FOR THE FOLLOWING PIPES : 1 4 16 31 34 38 41 47 50 57 62
 72 73 74 79 88 92 97 101 105
 RESULTS ARE OUTPUT FOR THE FOLLOWING PIPES : 109 116 120 128 134 146 152 166 174 179 185
 197 198 205 213 218 224 233 234 235
 RESULTS ARE OUTPUT FOR THE FOLLOWING PIPES : 501 503 600
 RESULTS ARE OUTPUT FOR THE FOLLOWING JUNCTION NODES : 1 2 14 15 16 27 28 36 37
 49 50 66 70 74 75
 RESULTS ARE OUTPUT FOR THE FOLLOWING JUNCTION NODES : 90 91 100 101 109 110 143 144 156
 157 18 23 204 205 302
 RESULTS ARE OUTPUT FOR THE FOLLOWING JUNCTION NODES : 165

THIS SYSTEM HAS 243 PIPES WITH 212 JUNCTIONS , 27 LOOPS AND 5 FCNS

THE RESULTS ARE OBTAINED AFTER 5 TRIALS WITH AN ACCURACY = .00356

UISCNRIO CHANGE 0:WORST CASE MAX FLOW SCENARIO FOR NORMAL LOW BAY WATER LEVEL
 (-6.0 FT);COPY OF U2NOPOWR CHANGE 7 SCENARIO RUN ON MODEL SET UP AS U1CALBN2;FOR
 SYSTEM LINEUP DETAILS OF U2NOPOWR CHANGE 7 SEE CALC G0050A-12 ATT 3

PIPE NO. LINE	NODE NOS. 1 IS CLOSED	FLOWRATE	HEAD LOSS	PUMP HEAD	MINOR LOSS	VELOCITY	HL/1000
4	0 4	7478.34	.04	110.92	.00	11.05	37.82
16	12 13	118.00	.41	.00	.23	3.87	36.46
LINE 31	IS CLOSED						
34	304 305	348.87	.40	.00	1.24	9.77	82.36
38	36 37	81.89	.06	.00	20.39	6.21	63.55
41	38 39	80.58	.06	.00	19.74	6.11	61.60
47	41 42	81.85	.06	.00	20.37	6.21	63.49
50	43 44	80.31	.06	.00	19.61	6.09	61.21
57	49 50	11.38	.13	.00	7.90	5.04	128.95
62	53 54	12.85	.16	.00	4.03	5.70	162.66
72	59 62	1354.17	.00	.00	2.26	2.58	1.27
73	60 63	1314.53	.00	.00	2.13	2.51	1.20
74	61 64	1331.30	.00	.00	2.18	2.54	1.23
LINE 79	IS CLOSED						

ATTACHMENT E: UISCNRIO RESULTS FILE

LINE	88	IS	CLOSED						
LINE	92	IS	CLOSED						
LINE	97	IS	CLOSED						
LINE	101	IS	CLOSED						
105	88	68		.00	.00	.00	.00	.00	.00
LINE	109	IS	CLOSED						
LINE	116	IS	CLOSED						
LINE	120	IS	CLOSED						
LINE	128	IS	CLOSED						
LINE	134	IS	CLOSED						
LINE	146	IS	CLOSED						
LINE	152	IS	CLOSED						
166	143	144		1401.60	.03	752.61	.00	8.99	28.63
174	156	157		1398.40	.03	752.71	.00	8.97	28.51
179	148	149		45.11	4.56	.00	2.32	9.40	265.29
185	160	161		44.22	4.39	.00	2.23	9.21	255.19
197	170	171		2800.00	.02	.00	.18	4.92	4.10
LINE	198	IS	CLOSED						
LINE	205	IS	CLOSED						
LINE	213	IS	CLOSED						
LINE	218	IS	CLOSED						
LINE	224	IS	CLOSED						
233	203	204		.00	.00	.00	.00	.00	.00
234	204	205		.00	.00	.00	.00	.00	.00
235	70	205		4000.00	.01	.00	.37	7.03	8.16
501	86	301		.00	.00	.00	.00	.00	.00
503	46	303		324.63	.04	.00	42.89	3.60	6.87
600	17	0		122.16	.00	.00	1.54	.14	.01

JUNCTION	NUMBER	DEMAND	GRADE LINE	ELEVATION	PRESSURE
1		.00	117.23	43.10	33.09
2		.00	117.23	42.40	33.40
14		.00	117.23	26.50	40.49
15		.00	117.64	26.50	40.68
16		.00	117.64	26.50	40.68
18		.00	115.51	36.30	35.36
23		.00	114.46	12.50	45.51
27		.00	114.46	11.00	46.18
28		.00	44.48	10.80	15.03
36		.00	112.57	17.50	42.43
37		.00	92.13	17.50	33.31
49		.00	107.82	8.30	44.42
50		.00	99.80	8.30	40.84
66		4000.00	107.18	77.20	13.38
70		-4000.00	41.48	74.10	-14.56
74		.00	114.66	17.50	43.36
75		.00	40.42	17.50	10.23
90		.00	114.66	31.60	37.07
91		.00	40.42	31.60	3.94
100		.00	114.66	11.40	46.09
101		.00	40.42	28.50	5.32
109		.00	116.46	44.40	32.16
110		.00	28.90	44.40	-6.92
143		.00	114.48	72.80	18.60
144		.00	867.06	74.20	353.88
156		.00	114.45	72.80	18.59

ATTACHMENT E: UISCNRIO RESULTS FILE

157	.00	867.14	74.20	353.91
165	-2800.00	41.29	58.80	-7.82
204	.00	41.11	33.10	3.57
205	.00	41.11	71.90	-13.74
302	2800.00	862.75	34.20	369.81

THE NET SYSTEM DEMAND = 118.00

SUMMARY OF INFLOWS(+) AND OUTFLOWS(-) FROM FIXED GRADE NODES

PIPE NUMBER	FLOWRATE
4	7478.34
158	.00
161	-7238.19
600	-122.16

THE NET FLOW INTO THE SYSTEM FROM FIXED GRADE NODES = 7478.34

THE NET FLOW OUT OF THE SYSTEM INTO FIXED GRADE NODES = -7360.36

A SUMMARY OF CONDITIONS SPECIFIED FOR THE NEXT SIMULATION FOLLOWS

THE FOLLOWING SPECIFIC DEMAND CHANGES ARE MADE :

JUNCTION NUMBER	DEMAND
13	110.00
66	.00
70	.00
165	.00
302	.00

LINE 31 IS OPEN
 LINE 79 IS OPEN
 LINE 88 IS OPEN
 LINE 92 IS OPEN
 LINE 97 IS OPEN
 LINE 101 IS OPEN
 LINE 109 IS OPEN
 LINE 116 IS OPEN
 LINE 120 IS OPEN
 LINE 128 IS OPEN
 LINE 134 IS OPEN
 LINE 198 IS OPEN

THE FOLLOWING CHANGES IN PIPE DATA ARE SPECIFIED

FOR PIPE NUMBER 600 THE VALUE OF THE FIXED GRADE IS CHANGED TO 26.5

PIPE NO.	NODE NOS.	LENGTH	DIAMETER	ROUGHNESS	MINOR LOSS K	FIXED GRADE
2	1 2	9.7	16.6	5.0	1.59	.00
5	4 5	9.7	16.6	5.0	1.59	.00
24	20 55	24.1	19.3	.2	420.08	.00
79	66 70	29.5	15.3	.2	85.93	.00
198	302 165	205.0	15.3	.2	2192.66	.00

THE RESULTS ARE OBTAINED AFTER 10 TRIALS WITH AN ACCURACY = .00199

UISCNRIO CHANGE 1:U2NOPOWR CHANGE 8 SCENARIO (CALC G0050A-12 ATT 3) RUN ON MODEL SET UP AS UICALBN2

NOTE: U2NOFOWR UNNECESSARILY ASSUMES 4 DGs;THIS RUN CHANGED TO STANDARD 2 DGs

PIPE NO.	NODE NOS.	FLOWRATE	HEAD LOSS	PUMP HEAD	MINOR LOSS	VELOCITY	HL/1000
LINE 1	IS CLOSED						
THE PUMP	IN LINE 4	IS OPERATING OUT OF RANGE					
4	0 4	8347.16	.05	88.74	.00	12.33	47.10
16	12 13	110.00	.36	.00	.20	3.61	31.71
31	27 28	42.01	.02	.00	18.15	3.19	17.82
34	304 305	321.17	.34	.00	1.05	8.99	70.14
38	36 37	65.53	.04	.00	13.05	4.97	41.45
41	38 39	64.48	.04	.00	12.64	4.89	40.19
47	41 42	65.50	.04	.00	13.04	4.97	41.42
50	43 44	64.27	.04	.00	12.56	4.88	39.94
57	49 50	9.10	.08	.00	5.06	4.03	84.36
62	53 54	10.28	.11	.00	2.58	4.56	106.22
72	59 62	687.25	.00	.00	.58	1.31	.36

ATTACHMENT E: UISCNRIO RESULTS FILE

73	60	63	666.99	.00	.00	.55	1.27	.34
74	61	64	675.82	.00	.00	.56	1.29	.35
79	66	70	2030.05	.07	.00	16.96	3.57	2.22
88	74	75	75.89	.05	.00	6.18	5.76	54.91
92	76	77	76.99	.06	.00	6.36	5.84	56.44
97	81	82	77.97	.06	.00	6.52	5.92	57.84
101	83	84	75.27	.05	.00	6.08	5.71	54.05
105	88	68	388.63	.78	.00	3.00	4.31	9.67
109	90	91	11.91	.14	.00	.43	5.28	140.71
116	96	97	11.95	.14	.00	1.31	5.30	141.50
120	100	101	58.65	.03	.00	1.23	4.45	33.54
128	109	110	950.21	.02	.00	6.72	6.94	18.74
134	115	116	908.57	.02	.00	1.37	6.63	17.19
LINE 146 IS CLOSED								
LINE 152 IS CLOSED								
166	143	144	1380.36	.03	753.30	.00	8.85	27.80
174	156	157	1377.22	.03	753.40	.00	8.83	27.68
179	148	149	37.42	3.18	.00	1.60	7.80	184.81
185	160	161	36.48	3.06	.00	1.53	7.64	177.78
197	170	171	2757.53	.02	.00	.17	4.84	3.99
198	302	165	2757.58	.82	.00	798.61	4.84	3.99
LINE 205 IS CLOSED								
LINE 213 IS CLOSED								
LINE 218 IS CLOSED								
LINE 224 IS CLOSED								
233	203	204	.00	.00	.00	.00	.00	.00
234	204	205	.00	.00	.00	.00	.00	.00
235	70	205	2030.05	.00	.00	.09	3.57	2.22
501	86	301	306.12	.01	.00	26.82	3.39	6.14
503	46	303	259.78	.03	.00	27.46	2.88	4.50
600	17	0	806.89	.00	.00	67.21	.95	.25

JUNCTION	NUMBER	DEMAND	GRADE LINE	ELEVATION	PRESSURE
1		.00	93.71	43.10	22.59
2		.00	93.71	42.40	22.90
14		.00	93.71	26.50	30.00
15		.00	93.71	26.50	30.00
16		.00	93.71	26.50	30.00
18		.00	92.34	36.30	25.01
23		.00	88.66	12.50	33.99
27		.00	83.19	11.00	32.22
28		.00	65.03	10.80	24.20
36		.00	87.44	17.50	31.22
37		.00	74.35	17.50	25.37
49		.00	84.33	8.30	33.96
50		.00	79.25	8.30	31.67
66		.00	57.53	77.20	-8.78
70		.00	40.50	74.10	-15.00
74		.00	84.80	17.50	30.04
75		.00	78.57	17.50	27.26
90		.00	87.70	31.60	25.04
91		.00	87.13	31.60	24.78
100		.00	77.18	11.40	29.36
101		.00	75.91	28.50	21.16
109		.00	61.76	44.40	7.75
110		.00	55.02	44.40	4.74

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143	.00	91.45	72.80	8.32
144	.00	844.72	74.20	343.91
156	.00	91.42	72.80	8.31
157	.00	844.80	74.20	343.94
165	.00	41.11	58.80	-7.90
204	.00	40.41	33.10	3.26
205	.00	40.41	71.90	-14.06
302	.00	840.53	34.20	359.89

THE NET SYSTEM DEMAND = 110.00

SUMMARY OF INFLOWS(+) AND OUTFLOWS(-) FROM FIXED GRADE NODES

PIPE NUMBER	FLOWRATE
4	8347.16
158	-1858.73
161	-5571.54
600	-806.89

THE NET FLOW INTO THE SYSTEM FROM FIXED GRADE NODES = 8347.16

THE NET FLOW OUT OF THE SYSTEM INTO FIXED GRADE NODES = -8237.16

A SUMMARY OF CONDITIONS SPECIFIED FOR THE NEXT SIMULATION FOLLOWS

THE FOLLOWING SPECIFIC DEMAND CHANGES ARE MADE :

JUNCTION NUMBER	DEMAND
66	4000.00
70	-4000.00
302	2800.00
165	-2800.00
13	124.00

LINE 31 IS CLOSED
 LINE 79 IS CLOSED
 LINE 88 IS CLOSED
 LINE 92 IS CLOSED
 LINE 97 IS CLOSED
 LINE 101 IS CLOSED
 LINE 109 IS CLOSED
 LINE 116 IS CLOSED
 LINE 120 IS CLOSED
 LINE 128 IS CLOSED
 LINE 134 IS CLOSED
 LINE 198 IS CLOSED

THE FOLLOWING CHANGES IN PIPE DATA ARE SPECIFIED

FOR PIPE NUMBER 1 THE VALUE OF THE FIXED GRADE IS CHANGED TO 22.0

FOR PIPE NUMBER 4 THE VALUE OF THE FIXED GRADE IS CHANGED TO 22.0

FOR PIPE NUMBER 600 THE VALUE OF THE FIXED GRADE IS CHANGED TO 116.1

PIPE NO.	NODE NOS.	LENGTH	DIAMETER	ROUGHNESS	MINOR LOSS K	FIXED GRADE
2	1 2	9.7	16.6	5.0	1.78	.00
5	4 5	9.7	16.6	5.0	1.78	.00
24	20 55	24.1	19.3	.2	.68	.00

THE RESULTS ARE OBTAINED AFTER 3 TRIALS WITH AN ACCURACY = .00159

UISCNRIO CHANGE 2:WORST CASE MAX FLOW SCENARIO FOR NORMAL HIGH BAY WATER LEVEL (+2.0 FT);COPY OF U2NOPOWR CHANGE 5 SCENARIO RUN ON MODEL SET UP AS U1CALBN2;FOR SYSTEM LINEUP DETAILS OF U2NOPOWR CHANGE 5 SEE CALC G0050A-12 ATT 3

PIPE NO.	NODE NOS.	FLOWRATE	HEAD LOSS	PUMP HEAD	MINOR LOSS	VELOCITY	HL/1000
LINE 1	IS CLOSED						
4	0 4	7611.95	.04	107.67	.00	11.24	39.18
16	12 13	124.00	.45	.00	.25	4.06	40.25
LINE 31	IS CLOSED						
34	304 305	359.40	.42	.00	1.32	10.06	87.26
38	36 37	84.36	.07	.00	21.64	6.40	67.29
41	38 39	83.01	.07	.00	20.95	6.30	65.23
47	41 42	84.32	.07	.00	21.62	6.40	67.23
50	43 44	82.74	.06	.00	20.81	6.28	64.82
57	49 50	11.73	.14	.00	8.39	5.20	136.50
62	53 54	13.24	.17	.00	4.28	5.87	172.22

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72	59	62	1354.17	.00	.00	2.26	2.58	1.27
73	60	63	1314.53	.00	.00	2.13	2.51	1.20
74	61	64	1331.30	.00	.00	2.18	2.54	1.23
LINE 79	IS	CLOSED						
LINE 88	IS	CLOSED						
LINE 92	IS	CLOSED						
LINE 97	IS	CLOSED						
LINE 101	IS	CLOSED						
105	88	68	.00	.00	.00	.00	.00	.00
LINE 109	IS	CLOSED						
LINE 116	IS	CLOSED						
LINE 120	IS	CLOSED						
LINE 128	IS	CLOSED						
LINE 134	IS	CLOSED						
LINE 146	IS	CLOSED						
LINE 152	IS	CLOSED						
166	143	144	1401.60	.03	752.61	.00	8.99	23.63
174	156	157	1398.40	.03	752.71	.00	8.97	28.51
179	148	149	46.49	4.84	.00	2.46	9.69	281.24
185	160	161	45.57	4.65	.00	2.37	9.50	270.53
197	170	171	2800.00	.02	.00	.18	4.92	4.10
LINE 198	IS	CLOSED						
LINE 205	IS	CLOSED						
LINE 213	IS	CLOSED						
LINE 218	IS	CLOSED						
LINE 224	IS	CLOSED						
233	203	204	.00	.00	.00	.00	.00	.00
234	204	205	.00	.00	.00	.00	.00	.00
235	70	205	4000.00	.01	.00	.37	7.03	8.16
501	86	301	.00	.00	.00	.00	.00	.00
503	46	303	334.44	.04	.00	45.52	3.71	7.27
600	17	0	236.55	.00	.00	5.78	.28	.02

JUNCTION	NUMBER	DEMAND	GRADE LINE	ELEVATION	PRESSURE
1		.00	121.79	43.10	35.12
2		.00	121.79	42.40	35.44
14		.00	121.79	26.50	42.53
15		.00	121.88	26.50	42.57
16		.00	121.88	26.50	42.57
18		.00	120.08	36.30	37.39
23		.00	118.96	12.50	47.52
27		.00	118.96	11.00	48.19
28		.00	44.69	10.80	15.12
36		.00	116.96	17.50	44.39
37		.00	95.25	17.50	34.70
49		.00	111.92	8.30	46.25
50		.00	103.40	8.30	42.44
66		4000.00	111.73	77.20	15.41
70		-4000.00	41.48	74.10	-14.56
74		.00	119.16	17.50	45.38
75		.00	40.42	17.50	10.23
90		.00	119.16	31.60	39.08
91		.00	40.42	31.60	3.94
100		.00	19.16	11.40	48.10
101		.00	40.42	28.50	5.32
109		.00	121.02	44.40	34.20

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110	.00	28.90	44.40	-6.92
143	.00	119.04	72.80	20.64
144	.00	871.62	74.20	355.92
156	.00	119.02	72.80	20.63
157	.00	871.70	74.20	355.95
165	-2800.00	41.30	58.80	-7.81
204	.00	41.11	33.10	3.57
205	.00	41.11	71.90	-13.74
302	2800.00	867.31	34.20	371.84

THE NET SYSTEM DEMAND = 124.00

SUMMARY OF INFLOWS(+) AND OUTFLOWS(-) FROM FIXED GRADE NODES

PIPE NUMBER	FLOWRATE
4	7611.95
158	.00
161	-7251.46
600	-236.55

THE NET FLOW INTO THE SYSTEM FROM FIXED GRADE NODES = 7611.95

THE NET FLOW OUT OF THE SYSTEM INTO FIXED GRADE NODES = -7488.01

A SUMMARY OF CONDITIONS SPECIFIED FOR THE NEXT SIMULATION FOLLOWS

THE FOLLOWING SPECIFIC DEMAND CHANGES ARE MADE :

JUNCTION NUMBER	DEMAND
66	.00
70	.00
302	.00
165	.00
13	110.00

LINE 31	IS OPEN
LINE 88	IS OPEN
LINE 92	IS OPEN
LINE 97	IS OPEN
LINE 101	IS OPEN
LINE 109	IS OPEN
LINE 116	IS OPEN
LINE 120	IS OPEN
LINE 128	IS OPEN
LINE 134	IS OPEN
LINE 79	IS OPEN
LINE 198	IS OPEN

THE FOLLOWING CHANGES IN PIPE DATA ARE SPECIFIED

FOR PIPE NUMBER 600 THE VALUE OF THE FIXED GRADE IS CHANGED TO 26.5

PIPE NO.	NODE NOS.	LENGTH	DIAMETER	ROUGHNESS	MINOR LOSS K	FIXED GRADE
2	1 2	9.7	16.6	5.0	1.56	.00
5	4 5	9.7	16.6	5.0	1.56	.00
24	20 55	24.1	19.3	.2	420.08	.00
79	66 70	29.5	15.3	.2	91.88	.00
198	302 165	205.0	15.3	.2	2204.74	.00

THE RESULTS ARE OBTAINED AFTER 10 TRIALS WITH AN ACCURACY = .00205

U1SCNRIO CHANGE 3:U2NOPOWR CHANGE 6 SCENARIO (CALC G0050A-12 ATT 3) RUN ON MODEL SET UP AS U1CALBN2

NOTE:U2NOPOWR UNNECESSARILY ASSUMES 4 DGs;THIS RUN CHANGED TO STANDARD 2 DGs

PIPE NO.	NODE NOS.	FLOWRATE	HEAD LOSS	PUMP HEAD	MINOR LOSS	VELOCITY	HL/1000
LINE 1	IS CLOSED						
THE PUMP IN LINE 4	IS OPERATING OUT OF RANGE						
4	0 4	8496.48	.05	84.73	.00	12.55	48.80
16	12 13	110.00	.36	.00	.20	3.61	31.71
31	27 28	43.48	.02	.00	19.44	3.30	19.01
34	304 305	332.52	.36	.00	1.13	9.31	75.03
38	36 37	67.85	.04	.00	14.00	5.15	44.31
41	38 39	66.76	.04	.00	13.55	5.07	42.96
47	41 42	67.82	.04	.00	13.98	5.15	44.27
50	43 44	66.55	.04	.00	13.46	5.05	42.69
57	49 50	9.43	.09	.00	5.42	4.18	90.12
62	53 54	10.64	.11	.00	2.76	4.72	113.50
72	59 62	703.32	.00	.00	.61	1.34	.37

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73	60	63	682.60	.00	.00	.57	1.30	.35
74	61	64	691.62	.00	.00	.59	1.32	.36
79	66	70	2077.53	.07	.00	18.99	3.65	2.32
88	74	75	78.55	.06	.00	6.62	5.96	58.67
92	76	77	79.69	.06	.00	6.81	6.05	60.31
97	81	82	80.71	.06	.00	6.99	6.13	61.80
101	83	84	77.91	.06	.00	6.51	5.91	57.75
105	88	68	402.23	.83	.00	3.21	4.46	10.33
109	90	91	12.32	.15	.00	.46	5.46	149.99
116	96	97	12.36	.15	.00	1.40	5.48	150.89
120	100	101	60.68	.04	.00	1.32	4.60	35.79
128	109	110	977.42	.02	.00	7.12	7.14	19.79
134	115	116	934.54	.02	.00	1.45	6.82	18.15
LINE 146	IS	CLOSED						
LINE 152	IS	CLOSED						
166	143	144	1379.77	.03	753.32	.00	8.85	27.78
174	156	157	1376.62	.03	753.42	.00	8.83	27.65
179	148	149	38.77	3.40	.00	1.71	8.08	197.84
185	160	161	38.03	3.28	.00	1.65	7.92	190.60
197	170	171	2756.39	.02	.00	.17	4.84	3.98
198	302	165	2756.39	.82	.00	802.32	4.84	3.98
LINE 205	IS	CLOSED						
LINE 213	IS	CLOSED						
LINE 218	IS	CLOSED						
LINE 224	IS	CLOSED						
233	203	204	.00	.00	.00	.00	.00	.00
234	204	205	.00	.00	.00	.00	.00	.00
235	70	205	2077.53	.00	.00	.10	3.65	2.32
501	86	301	316.87	.02	.00	28.74	3.51	6.56
503	46	303	268.98	.03	.00	29.44	2.98	4.81
600	17	0	829.05	.00	.00	70.95	.98	.26

JUNCTION	NUMBER	DEMAND	GRADE	LINE	ELEVATION	PRESSURE
1		.00	97.45		43.10	24.26
2		.00	97.45		42.40	24.57
14		.00	97.45		26.50	31.67
15		.00	97.45		26.50	31.67
16		.00	97.45		26.50	31.67
18		.00	96.04		36.30	26.66
23		.00	92.10		12.50	35.53
27		.00	86.20		11.00	33.56
28		.00	66.74		10.80	24.97
36		.00	90.79		17.50	32.71
37		.00	76.76		17.50	26.45
49		.00	87.52		8.30	35.36
50		.00	82.01		8.30	32.90
66		.00	59.58		77.20	-7.86
70		.00	40.52		74.10	-14.99
74		.00	87.97		17.50	31.45
75		.00	81.29		17.50	28.47
90		.00	90.98		31.60	26.50
91		.00	90.36		31.60	26.23
100		.00	79.79		11.40	30.52
101		.00	78.43		28.50	22.29
109		.00	63.67		44.40	8.60
110		.00	56.53		44.40	5.41

143	.00	95.14	72.80	9.97
144	.00	848.44	74.20	345.57
156	.00	95.12	72.80	9.96
157	.00	848.52	74.20	345.60
165	.00	41.12	58.80	-7.89
204	.00	40.42	33.10	3.27
205	.00	40.42	71.90	-14.05
302	.00	844.26	34.20	361.55

THE NET SYSTEM DEMAND = 110.00

SUMMARY OF INFLOWS(+) AND OUTFLOWS(-) FROM FIXED GRADE NODES

PIPE NUMBER	FLOWRATE
4	8496.48
158	-1911.96
161	-5645.47
600	-829.05

THE NET FLOW INTO THE SYSTEM FROM FIXED GRADE NODES = 8496.48

THE NET FLOW OUT OF THE SYSTEM INTO FIXED GRADE NODES = -8386.49

A SUMMARY OF CONDITIONS SPECIFIED FOR THE NEXT SIMULATION FOLLOWS

THE FOLLOWING SPECIFIC DEMAND CHANGES ARE MADE :

JUNCTION NUMBER	DEMAND
13	168.00
66	4000.00
70	-4000.00
302	2800.00
165	-2800.00

LINE 31 IS CLOSED
 LINE 38 IS CLOSED
 LINE 41 IS CLOSED
 LINE 47 IS CLOSED
 LINE 50 IS CLOSED
 LINE 57 IS CLOSED
 LINE 62 IS CLOSED
 LINE 79 IS CLOSED
 LINE 88 IS CLOSED
 LINE 92 IS CLOSED
 LINE 97 IS CLOSED
 LINE 101 IS CLOSED
 LINE 109 IS CLOSED
 LINE 116 IS CLOSED
 LINE 120 IS CLOSED
 LINE 128 IS CLOSED
 LINE 134 IS CLOSED
 LINE 198 IS CLOSED

THE FOLLOWING CHANGES IN PIPE DATA ARE SPECIFIED

FOR PIPE NUMBER 1 THE VALUE OF THE FIXED GRADE IS CHANGED TO 42.0

FOR PIPE NUMBER 4 THE VALUE OF THE FIXED GRADE IS CHANGED TO 42.0

FOR PIPE NUMBER 600 THE VALUE OF THE FIXED GRADE IS CHANGED TO 116.1

PIPE NO.	NODE NOS.	LENGTH	DIAMETER	ROUGHNESS	MINOR LOSS K	FIXED GRADE
2	1 2	9.7	16.6	5.0	1.79	.00
5	4 5	9.7	16.6	5.0	1.79	.00
24	20 55	24.1	19.3	.2	.68	.00

THE RESULTS ARE OBTAINED AFTER 2 TRIALS WITH AN ACCURACY = .00334

U1SCNRIO CHANGE 4: WORST CASE MAX FLOW SCENARIO FOR FLOOD BAY WATER LEVEL (+22.0 FT); COPY OF NOVTLHDR CHANGE 16 SCENARIO RUN ON MODEL SET UP AS U1CALBN2; FOR SYSTEM LINEUP DETAILS OF NOVTLHDR CHANGE 16 SEE CALC G0050A-12 ATT 17

PIPE NO.	NODE NOS.	FLOWRATE	HEAD LOSS	PUMP HEAD	MINOR LOSS	VELOCITY	HL/1000
LINE 1	IS CLOSED						
4	0 4	7581.47	.04	108.42	.00	11.20	38.87
16	12 13	168.00	.83	.00	.47	5.51	73.72
LINE 31	IS CLOSED						
34	304 305	.00	.00	.00	.00	.00	.00

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LINE 38 IS CLOSED								
LINE 41 IS CLOSED								
LINE 47 IS CLOSED								
LINE 50 IS CLOSED								
LINE 57 IS CLOSED								
LINE 62 IS CLOSED								
72 59 62	1354.17	.00	.00	2.26	2.58	1.27		
73 60 63	1314.53	.00	.00	2.13	2.51	1.20		
74 61 64	1331.30	.00	.00	2.18	2.54	1.23		
LINE 79 IS CLOSED								
LINE 88 IS CLOSED								
LINE 92 IS CLOSED								
LINE 97 IS CLOSED								
LINE 101 IS CLOSED								
105 88 68	.00	.00	.00	.00	.00	.00		
LINE 109 IS CLOSED								
LINE 116 IS CLOSED								
LINE 120 IS CLOSED								
LINE 128 IS CLOSED								
LINE 134 IS CLOSED								
LINE 146 IS CLOSED								
LINE 152 IS CLOSED								
166 143 144	1401.60	.03	752.61	.00	8.99	28.63		
174 156 157	1398.40	.03	752.71	.00	8.97	28.51		
179 148 149	52.48	6.12	.00	3.14	10.94	355.89		
185 160 161	51.44	5.89	.00	3.02	10.72	342.32		
197 170 171	2800.00	.02	.00	.18	4.92	4.10		
LINE 198 IS CLOSED								
LINE 205 IS CLOSED								
LINE 213 IS CLOSED								
LINE 218 IS CLOSED								
LINE 224 IS CLOSED								
233 203 204	.00	.00	.00	.00	.00	.00		
234 204 205	.00	.00	.00	.00	.00	.00		
235 70 205	4000.00	.01	.00	.37	7.03	8.16		
501 86 301	.00	.00	.00	.00	.00	.00		
503 46 303	.00	.00	.00	.00	.00	.00		
600 17 0	509.56	.00	.00	26.80	.60	.10		

JUNCTION	NUMBER	DEMAND	GRADE LINE	ELEVATION	PRESSURE
1		.00	142.59	43.10	44.40
2		.00	142.59	42.40	44.72
14		.00	142.59	26.50	51.81
15		.00	142.90	26.50	51.95
16		.00	142.90	26.50	51.95
18		.00	141.03	36.30	46.74
23		.00	141.03	12.50	57.37
27		.00	141.03	11.00	58.04
28		.00	40.98	10.80	13.47
36		.00	141.03	17.50	55.13
37		.00	40.98	17.50	10.48
49		.00	141.03	8.30	59.24
50		.00	40.98	8.30	14.58
66		4000.00	132.69	77.20	24.77
70		-4000.00	41.45	74.10	-14.57
74		.00	141.03	17.50	55.14

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75	.00	40.39	17.50	10.22
90	.00	141.03	31.60	48.84
91	.00	40.39	31.60	3.92
100	.00	141.03	11.40	57.86
101	.00	40.39	28.50	5.31
109	.00	141.89	44.40	43.51
110	.00	28.90	44.40	-6.92
143	.00	139.99	72.80	29.99
144	.00	892.57	74.20	365.26
156	.00	139.96	72.80	29.98
157	.00	892.65	74.20	365.30
165	-2800.00	41.10	58.80	-7.90
204	.00	41.08	33.10	3.56
205	.00	41.08	71.90	-13.76
302	2800.00	888.26	34.20	381.20

THE NET SYSTEM DEMAND = 168.00

SUMMARY OF INFLOWS(+) AND OUTFLOWS(-) FROM FIXED GRADE NODES

PIPE NUMBER	FLOWRATE
4	7581.47
158	.00
161	-6903.91
600	-509.56

THE NET FLOW INTO THE SYSTEM FROM FIXED GRADE NODES = 7581.47

THE NET FLOW OUT OF THE SYSTEM INTO FIXED GRADE NODES = -7413.47

A SUMMARY OF CONDITIONS SPECIFIED FOR THE NEXT SIMULATION FOLLOWS

THE FOLLOWING SPECIFIC DEMAND CHANGES ARE MADE :

JUNCTION NUMBER	DEMAND
13	110.00
66	.00
70	.00
302	.00
165	.00
LINE 79	IS OPEN
LINE 128	IS OPEN
LINE 134	IS OPEN
LINE 198	IS OPEN

THE FOLLOWING CHANGES IN PIPE DATA ARE SPECIFIED

FOR PIPE NUMBER 600 THE VALUE OF THE FIXED GRADE IS CHANGED TO 26.5

PIPE NO.	NODE NOS.	LENGTH	DIAMETER	ROUGHNESS	MINOR LOSS K	FIXED GRADE
2	1 2	9.7	16.6	5.0	1.47	.00
5	4 5	9.7	16.6	5.0	1.47	.00
79	66 70	29.5	15.3	.2	119.25	.00
198	302 165	205.0	15.3	.2	2261.08	.00

THE RESULTS ARE OBTAINED AFTER 7 TRIALS WITH AN ACCURACY = .00346

U1SCNRIO CHANGE 5:NOVTLHDR CHANGE 17 SCENARIO (CALC G0050A-12 ATT 17) RUN ON MODEL SET UP AS U1CALBN2

NOTE:NOVTLHDR UNNECESSARILY ASSUMES 4 DGs;THIS RUN CHANGED TO STANDARD 2 DGs

PIPE NO.	NODE NOS.	FLOWRATE	HEAD LOSS	PUMP HEAD	MINOR LOSS	VELOCITY	HL/1000
LINE 1	IS CLOSED						
THE PUMP IN LINE 4	IS OPERATING OUT OF RANGE						
4	0 4	8951.20	.05	72.53	.00	13.22	54.15
16	12 13	110.00	.36	.00	.20	3.61	31.71
LINE 31	IS CLOSED						
34	304 305	.00	.00	.00	.00	.00	.00
LINE 38	IS CLOSED						
LINE 41	IS CLOSED						
LINE 47	IS CLOSED						
LINE 50	IS CLOSED						
LINE 57	IS CLOSED						
LINE 62	IS CLOSED						
72	59 62	1065.90	.00	.00	1.40	2.03	.81
73	60 63	1034.64	.00	.00	1.32	1.97	.76
74	61 64	1047.99	.00	.00	1.35	2.00	.78
79	66 70	3148.53	.15	.00	56.62	5.53	5.14
LINE 88	IS CLOSED						
LINE 92	IS CLOSED						
LINE 97	IS CLOSED						
LINE 101	IS CLOSED						
105	88 68	.00	.00	.00	.00	.00	.00
LINE 109	IS CLOSED						

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LINE 116 IS CLOSED									
LINE 120 IS CLOSED									
128 109 110	1026.29	.02	.00	7.84	7.49	21.75			
134 115 116	981.28	.02	.00	1.59	7.16	19.94			
LINE 146 IS CLOSED									
LINE 152 IS CLOSED									
166 143 144	1368.77	.03	753.68	.00	8.78	27.35			
174 156 157	1365.65	.03	753.78	.00	8.76	27.23			
179 148 149	41.18	3.82	.00	1.93	8.58	222.34			
185 160 161	40.36	3.68	.00	1.86	8.41	213.88			
197 170 171	2734.42	.02	.00	.17	4.80	3.92			
198 302 165	2734.42	.80	.00	809.75	4.80	3.92			
LINE 205 IS CLOSED									
LINE 213 IS CLOSED									
LINE 218 IS CLOSED									
LINE 224 IS CLOSED									
233 203 204	.00	.00	.00	.00	.00	.00			
234 204 205	.00	.00	.00	.00	.00	.00			
235 70 205	3148.53	.00	.00	.23	5.53	5.14			
501 86 301	.00	.00	.00	.00	.00	.00			
503 46 303	.00	.00	.00	.00	.00	.00			
600 17 0	869.15	.00	.00	77.98	1.02	.29			

JUNCTION NUMBER	DEMAND	GRADE LINE	ELEVATION	PRESSURE
1	.00	104.48	43.10	27.40
2	.00	104.48	42.40	27.71
14	.00	104.48	26.50	34.80
15	.00	104.48	26.50	34.80
16	.00	104.48	26.50	34.80
18	.00	102.91	36.30	29.73
23	.00	102.91	12.50	40.35
27	.00	102.91	11.00	41.02
28	.00	40.86	10.80	13.42
36	.00	102.91	17.50	38.12
37	.00	40.86	17.50	10.43
49	.00	102.91	8.30	42.23
50	.00	40.86	8.30	14.53
66	.00	97.71	77.20	9.15
70	.00	40.94	74.10	-14.80
74	.00	102.91	17.50	38.12
75	.00	40.28	17.50	10.17
90	.00	102.91	31.60	31.83
91	.00	40.28	31.60	3.87
100	.00	102.91	11.40	40.84
101	.00	40.28	28.50	5.26
109	.00	67.23	44.40	10.19
110	.00	59.36	44.40	6.68
143	.00	101.97	72.80	13.02
144	.00	855.62	74.20	348.77
156	.00	101.95	72.80	13.01
157	.00	855.70	74.20	348.81
165	.00	40.97	58.80	-7.96
204	.00	40.71	33.10	3.39
205	.00	40.71	71.90	-13.92
302	.00	851.53	34.20	364.80

THE NET SYSTEM DEMAND = 110.00

SUMMARY OF INFLOWS(+) AND OUTFLOWS(-) FROM FIXED GRADE NODES

PIPE NUMBER	FLOWRATE
4	8951.20
158	-2007.57
161	-5964.48
600	-869.15

THE NET FLOW INTO THE SYSTEM FROM FIXED GRADE NODES = 8951.20

THE NET FLOW OUT OF THE SYSTEM INTO FIXED GRADE NODES = -8841.20

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A SUMMARY OF CONDITIONS SPECIFIED FOR THE NEXT SIMULATION FOLLOWS

THE FOLLOWING SPECIFIC DEMAND CHANGES ARE MADE :

JUNCTION NUMBER	DEMAND
13	179.00
66	.00
70	.00
302	4100.00
165	-4100.00

LINE 38 IS OPEN
 LINE 41 IS OPEN
 LINE 47 IS OPEN
 LINE 50 IS OPEN
 LINE 57 IS OPEN
 LINE 62 IS OPEN
 LINE 72 IS CLOSED
 LINE 73 IS CLOSED
 LINE 74 IS CLOSED
 LINE 128 IS CLOSED
 LINE 134 IS CLOSED
 LINE 198 IS CLOSED

THE FOLLOWING CHANGES IN PIPE DATA ARE SPECIFIED

FOR PIPE NUMBER 1 THE VALUE OF THE FIXED GRADE IS CHANGED TO 11.4
 FOR PIPE NUMBER 4 THE VALUE OF THE FIXED GRADE IS CHANGED TO 11.4
 FOR PIPE NUMBER 600 THE VALUE OF THE FIXED GRADE IS CHANGED TO 116.1

PIPE NO.	NODE NOS.	LENGTH	DIAMETER	ROUGHNESS	MINOR LOSS K	FIXED GRADE
2	1 2	9.7	16.6	5.0	2.77	.00
5	4 5	9.7	16.6	5.0	2.77	.00

THE RESULTS ARE OBTAINED AFTER 7 TRIALS WITH AN ACCURACY = .00307

UISCNRIO CHANGE 6:WORST CASE MAX FLOW SCENARIO FOR LOLO BAY WATER LEVEL (-8.63 FT); COPY OF RBCCWOUT CHANGE 2 SCENARIO RUN ON MODEL SET UP AS UICALBN2; FOR SYSTEM LINEUP DETAILS OF RBCCWOUT CHANGE 2 SEE CALC G0050A-12 ATT 19

PIPE NO.	NODE NOS.	FLOWRATE	HEAD LOSS	PUMP HEAD	MINOR LOSS	VELOCITY	HL/1000
LINE 1	IS CLOSED						
4	0 4	5476.34	.02	152.58	.00	8.09	20.30
16	12 13	179.00	.95	.00	.53	5.87	83.66
LINE 31	IS CLOSED						
34	304 305	441.78	.63	.00	1.99	12.37	130.46
38	36 37	102.36	.10	.00	31.85	7.77	97.69
41	38 39	100.71	.09	.00	30.84	7.64	94.68
47	41 42	102.31	.10	.00	31.82	7.76	97.59
50	43 44	100.38	.09	.00	30.63	7.62	94.07
57	49 50	17.38	.29	.00	18.43	7.70	290.47
62	53 54	18.64	.33	.00	8.48	8.26	332.43
LINE 72	IS CLOSED						

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LINE	73	IS	CLOSED						
LINE	74	IS	CLOSED						
79	66	70		.00	.00	.00	.00	.00	.00
LINE	88	IS	CLOSED						
LINE	92	IS	CLOSED						
LINE	97	IS	CLOSED						
LINE	101	IS	CLOSED						
105	88	68		.00	.00	.00	.00	.00	.00
LINE	109	IS	CLOSED						
LINE	116	IS	CLOSED						
LINE	120	IS	CLOSED						
LINE	128	IS	CLOSED						
LINE	134	IS	CLOSED						
LINE	146	IS	CLOSED						
LINE	152	IS	CLOSED						
166	143	144		2052.25	.06	725.81	.00	13.16	60.20
174	156	157		2047.75	.06	726.03	.00	13.14	59.95
179	148	149		56.50	7.07	.00	3.64	11.78	410.99
185	160	161		55.38	6.80	.00	3.49	11.54	395.21
197	170	171		4100.00	.04	.00	.39	7.20	8.56
LINE	198	IS	CLOSED						
LINE	205	IS	CLOSED						
LINE	213	IS	CLOSED						
LINE	218	IS	CLOSED						
LINE	224	IS	CLOSED						
233	203	204		.00	.00	.00	.00	.00	.00
234	204	205		.00	.00	.00	.00	.00	.00
235	70	205		.00	.00	.00	.00	.00	.00
501	86	301		.00	.00	.00	.00	.00	.00
503	46	303		405.74	.06	.00	66.99	4.50	10.50
600	17	0		643.69	.00	.00	42.77	.76	.16

JUNCTION NUMBER	DEMAND	GRADE LINE	ELEVATION	PRESSURE
1	.00	158.87	43.10	51.67
2	.00	158.87	42.40	51.98
14	.00	158.87	26.50	59.08
15	.00	158.87	26.50	59.08
16	.00	158.87	26.50	59.08
18	.00	158.16	36.30	54.39
23	.00	156.48	12.50	64.26
27	.00	156.50	11.00	64.94
28	.00	47.17	10.80	16.23
36	.00	153.55	17.50	60.72
37	.00	121.62	17.50	46.47
49	.00	141.21	8.30	59.32
50	.00	174.05	8.30	73.98
66	.00	40.14	77.20	-16.54
70	.00	40.14	74.10	-15.16
74	.00	156.79	17.50	62.17
75	.00	40.14	17.50	10.10
90	.00	156.79	31.60	55.88
91	.00	40.14	31.60	3.81
100	.00	156.79	11.40	64.89
101	.00	40.14	28.50	5.19
109	.00	158.55	44.40	50.95
110	.00	28.90	44.40	-6.92

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143	.00	156.35	72.80	37.29
144	.00	882.10	74.20	360.59
156	.00	156.30	72.80	37.27
157	.00	882.27	74.20	360.67
165	-4100.00	42.13	58.80	-7.44
204	.00	40.14	33.10	3.14
205	.00	40.14	71.90	-14.18
302	4100.00	872.89	34.20	374.34

THE NET SYSTEM DEMAND = 179.00

SUMMARY OF INFLOWS(+) AND OUTFLOWS(-) FROM FIXED GRADE NODES

PIPE NUMBER	FLOWRATE
4	5476.34
158	.00
161	-4653.66
600	-643.69

THE NET FLOW INTO THE SYSTEM FROM FIXED GRADE NODES = 5476.34
 THE NET FLOW OUT OF THE SYSTEM INTO FIXED GRADE NODES = -5297.35

A SUMMARY OF CONDITIONS SPECIFIED FOR THE NEXT SIMULATION FOLLOWS

THE FOLLOWING SPECIFIC DEMAND CHANGES ARE MADE :

JUNCTION NUMBER	DEMAND
13	110.00
66	.00
70	.00
165	.00
302	.00

LINE 31 IS OPEN
 LINE 88 IS OPEN
 LINE 92 IS OPEN
 LINE 97 IS OPEN
 LINE 101 IS OPEN
 LINE 109 IS OPEN
 LINE 116 IS OPEN
 LINE 120 IS OPEN
 LINE 128 IS OPEN
 LINE 134 IS OPEN
 LINE 198 IS OPEN

THE FOLLOWING CHANGES IN PIPE DATA ARE SPECIFIED

FOR PIPE NUMBER 600 THE VALUE OF THE FIXED GRADE IS CHANGED TO 26.5

PIPE NO.	NODE NOS.	LENGTH	DIAMETER	ROUGHNESS	MINOR LOSS K	FIXED GRADE
2	1 2	9.7	16.6	5.0	1.82	.00
5	4 5	9.7	16.6	5.0	1.82	.00
198	302 165	205.0	15.3	.2	1035.00	.00

THE RESULTS ARE OBTAINED AFTER 9 TRIALS WITH AN ACCURACY = .00285

UISCNRIO CHANCE 7:RBCCWOUT CHANGE 3 SCENARIO (CALC G0050A-12 ATT 19) RUN ON
 MODEL SET UP AS U1CALEN2

NOTE:RBCCWOUT DID NOT THROTTLE RHRSW TO 4100 GPM AS PER G0050A-12 p77;THIS DOES

PIPE NO.	NODE NOS.	FLOWRATE	HEAD LOSS	PUMP HEAD	MINOR LOSS	VELOCITY	HL/1000
LINE 1	IS CLOSED						
4	0 4	7833.14	.04	102.16	.00	11.57	41.49
16	12 13	110.00	.36	.00	.20	3.61	31.71
31	27 28	49.67	.02	.00	25.37	3.77	24.46
34	304 305	356.99	.41	.00	1.30	9.99	86.13
38	36 37	72.14	.05	.00	15.82	5.47	49.82
41	38 39	70.98	.05	.00	15.32	5.39	48.30
47	41 42	72.11	.05	.00	15.81	5.47	49.78
50	43 44	70.75	.05	.00	15.22	5.37	48.00
57	49 50	10.02	.10	.00	6.13	4.44	101.26
62	53 54	11.32	.13	.00	3.13	5.02	127.59
LINE 72	IS CLOSED						
LINE 73	IS CLOSED						
LINE 74	IS CLOSED						
79	66 70	.00	.00	.00	.00	.00	.00
88	74 75	84.19	.07	.00	7.61	6.39	67.02

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92	76	77	85.41	.07	.00	7.83	6.48	68.91
97	81	82	86.50	.07	.00	8.03	6.56	70.60
101	83	84	83.50	.07	.00	7.48	6.34	65.97
105	88	68	428.29	.93	.00	3.64	4.75	11.65
109	90	91	11.84	.14	.00	.43	5.25	139.14
116	96	97	11.82	.14	.00	1.28	5.24	138.64
120	100	101	65.02	.04	.00	1.51	4.93	40.84
128	109	110	1032.23	.02	.00	7.94	7.54	21.99
134	115	116	986.96	.02	.00	1.61	7.21	20.17
LINE 146	IS	CLOSED						
LINE 152	IS	CLOSED						
166	143	144	1984.44	.06	729.10	.00	12.73	56.38
174	156	157	1980.09	.06	729.31	.00	12.70	56.14
179	148	149	41.17	3.82	.00	1.93	8.58	222.25
185	160	161	40.34	3.68	.00	1.85	8.41	213.70
197	170	171	3964.53	.04	.00	.36	6.96	8.02
198	302	165	3964.53	1.64	.00	779.17	6.96	8.02
LINE 205	IS	CLOSED						
LINE 213	IS	CLOSED						
LINE 218	IS	CLOSED						
LINE 224	IS	CLOSED						
233	203	204	.00	.00	.00	.00	.00	.00
234	204	205	.00	.00	.00	.00	.00	.00
235	70	205	.00	.00	.00	.00	.00	.00
501	86	301	339.60	.02	.00	33.01	3.76	7.48
503	46	303	285.98	.03	.00	33.28	3.17	5.40
600	17	0	872.63	.00	.00	78.60	1.03	.29

JUNCTION	NUMBER	DEMAND	GRADE LINE	ELEVATION	PRESSURE
1		.00	105.10	43.10	27.67
2		.00	105.10	42.40	27.99
14		.00	105.10	26.50	35.08
15		.00	105.10	26.50	35.08
16		.00	105.10	26.50	35.08
18		.00	104.00	36.30	30.22
23		.00	99.50	12.50	38.83
27		.00	100.19	11.00	39.81
28		.00	74.79	10.80	28.56
36		.00	98.02	17.50	35.94
37		.00	82.17	17.50	28.86
49		.00	94.33	8.30	38.40
50		.00	88.11	8.30	35.62
66		.00	40.15	77.20	-16.54
70		.00	40.15	74.10	-15.15
74		.00	94.78	17.50	34.49
75		.00	87.10	17.50	31.07
90		.00	89.04	31.60	25.64
91		.00	88.47	31.60	25.38
100		.00	85.49	11.40	33.07
101		.00	83.94	28.50	24.74
109		.00	67.67	44.40	10.39
110		.00	59.71	44.40	6.83
143		.00	102.31	72.80	13.17
144		.00	831.36	74.20	337.94
156		.00	102.26	72.80	13.15
157		.00	831.52	74.20	338.02

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165	.00	41.94	58.80	-7.53
204	.00	40.15	33.10	3.15
205	.00	40.15	71.90	-14.17
302	.00	822.75	34.20	351.95

THE NET SYSTEM DEMAND = 110.00

SUMMARY OF INFLOWS(+) AND OUTFLOWS(-) FROM FIXED GRADE NODES

PIPE NUMBER	FLOWRATE
4	7833.14
158	-2019.19
161	-4831.33
600	-872.63

THE NET FLOW INTO THE SYSTEM FROM FIXED GRADE NODES = 7833.14
 THE NET FLOW OUT OF THE SYSTEM INTO FIXED GRADE NODES = -7723.14

A SUMMARY OF CONDITIONS SPECIFIED FOR THE NEXT SIMULATION FOLLOWS

THE FOLLOWING SPECIFIC DEMAND CHANGES ARE MADE :

JUNCTION NUMBER	DEMAND
13	167.00
66	.00
70	.00
302	4600.00
165	-4600.00

LINE 31 IS CLOSED
 LINE 88 IS CLOSED
 LINE 92 IS CLOSED
 LINE 97 IS CLOSED
 LINE 101 IS CLOSED
 LINE 109 IS CLOSED
 LINE 116 IS CLOSED
 LINE 120 IS CLOSED
 LINE 128 IS CLOSED
 LINE 134 IS CLOSED
 LINE 198 IS CLOSED

THE FOLLOWING CHANGES IN PIPE DATA ARE SPECIFIED

FOR PIPE NUMBER 1 THE VALUE OF THE FIXED GRADE IS CHANGED TO 42.0
 FOR PIPE NUMBER 4 THE VALUE OF THE FIXED GRADE IS CHANGED TO 42.0
 FOR PIPE NUMBER 600 THE VALUE OF THE FIXED GRADE IS CHANGED TO 116.1

PIPE NO.	NODE NOS.	LENGTH	DIAMETER	ROUGHNESS	MINOR LOSS K	FIXED GRADE
2	1 2	9.7	16.6	5.0	2.41	.00
5	4 5	9.7	16.6	5.0	2.41	.00

THE RESULTS ARE OBTAINED AFTER 3 TRIALS WITH AN ACCURACY = .00043

U1SCNRIO CHANGE 8:ALT WORST CASE MAX FLOW SCENARIO FOR FLOOD BAY WATER LEVEL
 (+22 FT);COPY OF RBCCWOUT CHANGE 4 SCENARIO RUN ON MODEL SET UP AS U1CALBN2; FOR
 SYSTEM LINEUP DETAILS OF RBCCWOUT CHANGE 4 SEE CALC C0050A-12 ATT 19

PIPE NO.	NODE NOS.	FLOWRATE	HEAD LOSS	PUMP HEAD	MINOR LOSS	VELOCITY	HL/1000
LINE 1	IS CLOSED						
4	0 4	6120.99	.03	140.61	.00	9.04	25.35
16	12 13	167.00	.82	.00	.46	5.47	72.85
LINE 31	IS CLOSED						
34	304 305	467.80	.70	.00	2.24	13.09	145.88
38	36 37	109.81	.11	.00	36.66	8.33	111.91
41	38 39	108.04	.11	.00	35.49	8.20	108.45
47	41 42	109.75	.11	.00	36.62	8.33	111.80
50	43 44	107.68	.11	.00	35.25	8.17	107.76
57	49 50	15.27	.23	.00	14.22	6.77	226.35
62	53 54	17.25	.29	.00	7.26	7.64	286.12
LINE 72	IS CLOSED						
LINE 73	IS CLOSED						

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LINE 74	IS	CLOSED						
79	66	70	.00	.00	.00	.00	.00	.00
LINE 88	IS	CLOSED						
LINE 92	IS	CLOSED						
LINE 97	IS	CLOSED						
LINE 101	IS	CLOSED						
105	88	68	.00	.00	.00	.00	.00	.00
LINE 109	IS	CLOSED						
LINE 116	IS	CLOSED						
LINE 120	IS	CLOSED						
LINE 128	IS	CLOSED						
LINE 134	IS	CLOSED						
LINE 146	IS	CLOSED						
LINE 152	IS	CLOSED						
166	143	144	2302.50	.08	712.62	.00	14.77	75.41
174	156	157	2297.50	.08	712.90	.00	14.74	75.09
179	148	149	60.54	8.09	.00	4.18	12.62	470.23
185	160	161	59.34	7.78	.00	4.01	12.37	452.14
197	170	171	4600.00	.05	.00	.49	8.08	10.69
LINE 198	IS	CLOSED						
LINE 205	IS	CLOSED						
LINE 213	IS	CLOSED						
LINE 218	IS	CLOSED						
LINE 224	IS	CLOSED						
233	203	204	.00	.00	.00	.00	.00	.00
234	204	205	.00	.00	.00	.00	.00	.00
235	70	205	.00	.00	.00	.00	.00	.00
501	86	301	.00	.00	.00	.00	.00	.00
503	46	303	435.28	.07	.00	77.11	4.83	12.01
600	17	0	766.27	.00	.00	60.61	.90	.22

JUNCTION	NUMBER	DEMAND	GRADE LINE	ELEVATION	PRESSURE
1		.00	176.71	43.10	59.64
2		.00	176.71	42.40	59.95
14		.00	176.71	26.50	67.04
15		.00	176.71	26.50	67.04
16		.00	176.71	26.50	67.04
18		.00	175.83	36.30	62.28
23		.00	173.95	12.50	72.06
27		.00	173.95	11.00	72.73
28		.00	48.26	10.80	16.72
36		.00	170.59	17.50	68.33
37		.00	133.82	17.50	51.92
49		.00	162.08	8.30	68.64
50		.00	147.64	8.30	62.19
66		.00	40.17	77.20	-16.53
70		.00	40.17	74.10	-15.14
74		.00	174.29	17.50	69.98
75		.00	40.17	17.50	10.12
90		.00	174.29	31.60	63.69
91		.00	40.17	31.60	3.82
100		.00	174.29	11.40	72.70
101		.00	40.17	28.50	5.21
109		.00	176.32	44.40	58.88
110		.00	28.90	44.40	-6.92
143		.00	173.55	72.80	44.97

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144	.00	886.10	74.20	362.38
156	.00	173.49	72.80	44.94
157	.00	886.32	74.20	362.48
165	-4600.00	42.64	58.80	-7.21
204	.00	40.17	33.10	3.15
205	.00	40.17	71.90	-14.16
302	4600.00	874.53	34.20	375.07

THE NET SYSTEM DEMAND = 167.00

SUMMARY OF INFLOWS(+) AND OUTFLOWS(-) FROM FIXED GRADE NODES

PIPE NUMBER	FLOWRATE
4	6120.99
158	.00
161	-5187.68
600	-766.27

THE NET FLOW INTO THE SYSTEM FROM FIXED GRADE NODES = 6120.99

THE NET FLOW OUT OF THE SYSTEM INTO FIXED GRADE NODES = -5953.95

THE FOLLOWING SPECIFIC DEMAND CHANGES ARE MADE :

13	110.00
66	.00
70	.00
165	.00
302	.00

FOR PIPE NUMBER 600 THE VALUE OF THE FIXED GRADE IS CHANGED TO 26.5

THE RESULTS ARE OBTAINED AFTER 10 TRIALS WITH AN ACCURACY = .00222

UISCNRI0 CHANGE 9:RBCCWOUT CHANGE 5 SCENARIO (CALC G0050A-12 ATT 19) RUN ON
MODEL SET UP AS UICALBN2
NOTE:RBCCWOUT DIDNT INITIAL THRTL RHRSW TO 4600 GPM AS PER TSI ATT 5;THIS DOES

PIPE NO.	NODE NOS.	FLOWRATE	HEAD LOSS	PUMP HEAD	MINOR LOSS	VELOCITY	HL/1000
LINE 1	IS CLOSED						
THE PUMP IN LINE 4	IS OPERATING OUT OF RANGE						
4	0 4	8559.35	.05	83.04	.00	12.64	49.52
16	12 13	110.00	.36	.00	.20	3.61	31.71
31	27 28	49.83	.02	.00	25.53	3.78	24.61
34	304 305	380.99	.47	.00	1.48	10.66	97.75
38	36 37	77.73	.06	.00	18.37	5.90	57.50
41	38 39	76.49	.06	.00	17.79	5.80	55.74
47	41 42	77.70	.06	.00	18.35	5.90	57.45
50	43 44	76.24	.06	.00	17.67	5.79	55.39
57	49 50	10.80	.12	.00	7.12	4.79	116.74
62	53 54	12.20	.15	.00	3.63	5.41	147.20
LINE 72	IS CLOSED						
LINE 73	IS CLOSED						
LINE 74	IS CLOSED						
79	66 70	.00	.00	.00	.00	.00	.00

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88	74	75	90.74	.08	.00	8.83	6.89	77.42
92	76	77	92.05	.08	.00	9.09	6.99	79.60
97	81	82	93.22	.08	.00	9.32	7.07	81.56
101	83	84	89.99	.08	.00	8.69	6.83	76.19
105	88	68	464.30	1.09	.00	4.28	5.15	13.59
109	90	91	12.84	.16	.00	.50	5.69	162.26
116	96	97	12.80	.16	.00	1.50	5.67	161.38
120	100	101	72.67	.05	.00	1.89	5.51	50.52
128	109	110	1101.28	.02	.00	9.03	8.04	24.93
134	115	116	1052.99	.02	.00	1.84	7.69	22.86
LINE 146	IS	CLOSED						
LINE 152	IS	CLOSED						
166	143	144	2218.68	.07	717.22	.00	14.23	70.13
174	156	157	2213.87	.07	717.48	.00	14.20	69.83
179	148	149	44.33	4.41	.00	2.24	9.24	256.47
185	160	161	43.44	4.24	.00	2.15	9.05	246.57
197	170	171	4432.56	.05	.00	.45	7.79	9.95
198	302	165	4432.56	2.04	.00	774.19	7.79	9.95
LINE 205	IS	CLOSED						
LINE 213	IS	CLOSED						
LINE 218	IS	CLOSED						
LINE 224	IS	CLOSED						
233	203	204	.00	.00	.00	.00	.00	.00
234	204	205	.00	.00	.00	.00	.00	.00
235	70	205	.00	.00	.00	.00	.00	.00
501	86	301	366.00	.02	.00	38.34	4.06	8.63
503	46	303	308.16	.04	.00	38.64	3.42	6.22
600	17	0	929.46	.00	.00	89.17	1.09	.33

JUNCTION	NUMBER	DEMAND	GRADE LINE	ELEVATION	PRESSURE
1		.00	115.68	43.10	32.39
2		.00	115.68	42.40	32.71
14		.00	115.68	26.50	39.80
15		.00	115.67	26.50	39.80
16		.00	115.67	26.50	39.80
18		.00	114.33	36.30	34.83
23		.00	109.13	12.50	43.13
27		.00	101.42	11.00	40.36
28		.00	75.87	10.80	29.04
36		.00	107.42	17.50	40.14
37		.00	89.00	17.50	31.91
49		.00	103.14	8.30	42.33
50		.00	95.90	8.30	39.10
66		.00	40.18	77.20	-16.52
70		.00	40.18	74.10	-15.14
74		.00	103.64	17.50	38.45
75		.00	94.73	17.50	34.47
90		.00	97.44	31.60	29.39
91		.00	96.78	31.60	29.09
100		.00	96.45	11.40	37.96
101		.00	94.51	28.50	29.46
109		.00	73.03	44.40	12.78
110		.00	63.97	44.40	8.73
143		.00	112.22	72.80	17.60
144		.00	829.37	74.20	337.06
156		.00	112.17	72.80	17.57

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157	.00	829.57	74.20	337.15
165	.00	42.40	58.80	-7.32
204	.00	40.18	33.10	3.16
205	.00	40.18	71.90	-14.16
302	.00	818.63	34.20	350.12

THE NET SYSTEM DEMAND = 110.00

SUMMARY OF INFLOWS(+) AND OUTFLOWS(-) FROM FIXED GRADE NODES

PIPE NUMBER	FLOWRATE
4	8559.35
158	-2154.27
161	-5365.61
600	-929.46

THE NET FLOW INTO THE SYSTEM FROM FIXED GRADE NODES = 8559.35

THE NET FLOW OUT OF THE SYSTEM INTO FIXED GRADE NODES = -8449.34

A SUMMARY OF CONDITIONS SPECIFIED FOR THE NEXT SIMULATION FOLLOWS

THE FOLLOWING SPECIFIC DEMAND CHANGES ARE MADE :

JUNCTION NUMBER	DEMAND
13	128.00
66	4000.00
70	-4000.00
302	2800.00
165	-2800.00

LINE 31 IS CLOSED
LINE 38 IS CLOSED
LINE 41 IS CLOSED
LINE 47 IS CLOSED
LINE 50 IS CLOSED
LINE 57 IS CLOSED
LINE 62 IS CLOSED
LINE 72 IS OPEN
LINE 73 IS OPEN
LINE 74 IS OPEN
LINE 79 IS CLOSED
LINE 88 IS CLOSED
LINE 92 IS CLOSED
LINE 97 IS CLOSED
LINE 101 IS CLOSED
LINE 109 IS CLOSED
LINE 116 IS CLOSED
LINE 120 IS CLOSED
LINE 128 IS CLOSED
LINE 134 IS CLOSED
LINE 198 IS CLOSED

THE FOLLOWING CHANGES IN PIPE DATA ARE SPECIFIED

FOR PIPE NUMBER 1 THE VALUE OF THE FIXED GRADE IS CHANGED TO 14.0

FOR PIPE NUMBER 4 THE VALUE OF THE FIXED GRADE IS CHANGED TO 14.0

FOR PIPE NUMBER 600 THE VALUE OF THE FIXED GRADE IS CHANGED TO 116.1

PIPE NO.	NODE NOS.	LENGTH	DIAMETER	ROUGHNESS	MINOR LOSS K	FIXED GRADE
2	1 2	9.7	16.6	5.0	1.89	.00
5	4 5	9.7	16.6	5.0	1.89	.00
24	20 55	24.1	19.3	.2	.68	.00

THE RESULTS ARE OBTAINED AFTER 3 TRIALS WITH AN ACCURACY = .00464

U1SCNRIO CHANGE 10:ALT WORST CASE MAX FLOW SCENARIO FOR NORMAL LOW BAY WATER LVL (-6 FT); COPY OF NOVTLHDR CHANGE 14 SCENARIO RUN ON MODEL SET UP AS U1CALBN2; FOR SYSTEM LINEUP DETAILS OF NOVTLHDA CHANGE 14 SEE CALC G0050A-12 ATT 17

PIPE NO.	NODE NOS.	FLOWRATE	HEAD LOSS	PUMP HEAD	MINOR LOSS	VELOCITY	HL/1000
LINE 4	1 IS CLOSED 0 4	7271.87	.04	115.83	.00	10.74	35.76

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16	12	13	128.00	.48	.00	.27	4.20	42.88
LINE 31	IS	CLOSED						
34	304	305	.00	.00	.00	.00	.00	.00
LINE 38	IS	CLOSED						
LINE 41	IS	CLOSED						
LINE 47	IS	CLOSED						
LINE 50	IS	CLOSED						
LINE 57	IS	CLOSED						
LINE 62	IS	CLOSED						
72	59	62	1353.84	.00	.00	2.26	2.58	1.27
73	60	63	1315.29	.00	.00	2.13	2.51	1.20
74	61	64	1330.87	.00	.00	2.18	2.54	1.23
LINE 79	IS	CLOSED						
LINE 88	IS	CLOSED						
LINE 92	S	CLOSED						
LINE 97	IS	CLOSED						
LINE 101	IS	CLOSED						
105	88	68	.00	.00	.00	.00	.00	.00
LINE 109	IS	CLOSED						
LINE 116	IS	CLOSED						
LINE 120	IS	CLOSED						
LINE 128	IS	CLOSED						
LINE 134	IS	CLOSED						
LINE 146	IS	CLOSED						
LINE 152	IS	CLOSED						
166	143	144	1401.60	.03	752.61	.00	8.99	28.63
174	156	157	1398.40	.03	752.71	.00	8.97	28.51
179	148	149	46.79	4.90	.00	2.50	9.75	284.83
185	160	161	45.87	4.71	.00	2.40	9.56	273.98
197	170	171	2800.00	.02	.00	.18	4.92	4.10
LINE 198	IS	CLOSED						
LINE 205	IS	CLOSED						
LINE 213	IS	CLOSED						
LINE 218	IS	CLOSED						
LINE 224	IS	CLOSED						
233	203	204	.00	.00	.00	.00	.00	.00
234	204	205	.00	.00	.00	.00	.00	.00
235	70	205	4000.00	.01	.00	.37	7.03	8.16
501	86	301	.00	.00	.00	.00	.00	.00
503	46	303	.00	.00	.00	.00	.00	.00
600	17	0	251.22	.00	.00	6.51	.30	.03

JUNCTION	NUMBER	DEMAND	GRADE LINE	ELEVATION	PRESSURE
1		.00	122.44	43.10	35.41
2		.00	122.44	42.40	35.73
14		.00	122.44	26.50	42.82
15		.00	122.61	26.50	42.90
16		.00	122.61	26.50	42.90
18		.00	120.89	36.30	37.76
23		.00	120.89	12.50	48.38
27		.00	120.89	11.00	49.05
28		.00	40.97	10.80	13.47
36		.00	120.89	17.50	46.15
37		.00	40.97	17.50	10.48
49		.00	120.89	8.30	50.25
50		.00	40.97	8.30	14.58

66	4000.00	112.55	77.20	15.78
70	-4000.00	41.45	74.10	14.57
74	.00	120.89	17.50	46.15
75	.00	40.39	17.50	10.22
90	.00	120.89	31.60	39.85
91	.00	40.39	31.60	3.92
100	.00	120.89	11.40	48.87
101	.00	40.39	28.50	5.31
109	.00	121.75	44.40	34.52
110	.00	28.90	44.40	-6.92
143	.00	119.85	72.80	21.00
144	.00	872.43	74.20	356.28
156	.00	119.83	72.80	20.99
157	.00	872.51	74.20	356.31
165	-2800.00	41.09	58.80	-7.91
204	.00	41.07	33.10	3.56
205	.00	41.07	71.90	-13.76
302	2800.00	868.12	34.20	372.21

THE NET SYSTEM DEMAND = 128.00

SUMMARY OF INFLOWS(+) AND OUTFLOWS(-) FROM FIXED GRADE NODES

PIPE NUMBER	FLOWRATE
4	7271.87
158	.00
161	-6892.66
600	-251.22

THE NET FLOW INTO THE SYSTEM FROM FIXED GRADE NODES = 7271.87

THE NET FLOW OUT OF THE SYSTEM INTO FIXED GRADE NODES = -7143.87

A SUMMARY OF CONDITIONS SPECIFIED FOR THE NEXT SIMULATION FOLLOWS

THE FOLLOWING SPECIFIC DEMAND CHANGES ARE MADE :

JUNCTION NUMBER	DEMAND
13	110.00
66	.00
70	.00
302	.00
165	.00

LINE 79 IS OPEN
 LINE 198 IS OPEN
 LINE 128 IS OPEN
 LINE 134 IS OPEN

THE FOLLOWING CHANGES IN PIPE DATA ARE SPECIFIED

FOR PIPE NUMBER 600 THE VALUE OF THE FIXED GRADE IS CHANGED TO 26.5

PIPE NO.	NODE NOS.	LENGTH	DIAMETER	ROUGHNESS	MINOR LOSS K	FIXED GRADE
2	1 2	9.7	16.6	5.0	1.55	.00
5	4 5	9.7	16.6	5.0	1.55	.00
79	66 70	29.5	15.3	.2	93.02	.00
198	302 165	205.0	15.3	.2	2207.61	.00

THE RESULTS ARE OBTAINED AFTER 7 TRIALS WITH AN ACCURACY = .00283

UISCNRIO CHANGE 11:NOVTLHDR CHANGE 15 SCENARIO (CALC G0050A-12 ATT 17) RUN ON MODEL SET UP AS UICALBN2

PIPE NO.	NODE NOS.	FLOWRATE	HEAD LOSS	PUMP HEAD	MINOR LOSS	VELOCITY	HL/1000
LINE 1	IS CLOSED						
THE PUMP IN LINE 4	IS OPERATING OUT OF RANGE						
4	0 4	8524.42	.05	83.98	.00	12.59	49.12
16	12 13	110.00	.36	.00	.20	3.61	31.71
LINE 31	IS CLOSED						
34	304 305	.00	.00	.00	.00	.00	.00
LINE 38	IS CLOSED						
LINE 41	IS CLOSED						
LINE 47	IS CLOSED						
LINE 50	IS CLOSED						
LINE 57	IS CLOSED						
LINE 62	IS CLOSED						
72	59 62	1030.74	.00	.00	1.31	1.97	.76
73	60 63	1000.50	.00	.00	1.23	1.91	.72
74	61 64	1013.43	.00	.00	1.27	1.93	.73
79	66 70	3044.67	.14	.00	41.30	5.35	4.82
LINE 88	IS CLOSED						
LINE 92	IS CLOSED						
LINE 97	IS CLOSED						
LINE 101	IS CLOSED						
105	88 68	.00	.00	.00	.00	.00	.00
LINE 109	IS CLOSED						

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LINE 116	IS	CLOSED						
LINE 120	IS	CLOSED						
128	109	110	911.62	.02	.00	6.19	6.66	17.30
134	115	116	871.62	.02	.00	1.26	6.36	15.86
LINE 146	IS	CLOSED						
LINE 152	IS	CLOSED						
166	143	144	1371.65	.03	753.58	.00	8.80	27.46
174	156	157	1368.53	.03	753.68	.00	8.78	27.34
179	148	149	35.51	2.87	.00	1.44	7.40	166.99
185	160	161	34.80	2.76	.00	1.38	7.25	160.63
197	170	171	2740.18	.02	.00	.17	4.81	3.94
198	302	165	2740.18	.81	.00	793.94	4.81	3.94
LINE 205	IS	CLOSED						
LINE 213	IS	CLOSED						
LINE 218	IS	CLOSED						
LINE 224	IS	CLOSED						
233	203	204	.00	.00	.00	.00	.00	.00
234	204	205	.00	.00	.00	.00	.00	.00
235	70	205	3044.67	.00	.00	.21	5.35	4.82
501	86	301	.00	.00	.00	.00	.00	.00
503	46	303	.00	.00	.00	.00	.00	.00
600	17	0	776.03	.00	.00	62.16	.91	.23

JUNCTION	NUMBER	DEMAND	GRADE LINE	ELEVATION	PRESSURE
1		.00	88.66	43.10	20.34
2		.00	88.66	42.40	20.65
14		.00	88.66	26.50	27.75
15		.00	88.66	26.50	27.75
16		.00	88.66	26.50	27.75
18		.00	87.20	36.30	22.72
23		.00	87.20	12.50	33.34
27		.00	87.20	11.00	34.01
28		.00	40.85	10.80	13.41
36		.00	87.20	17.50	31.11
37		.00	40.85	17.50	10.42
49		.00	87.20	8.30	35.21
50		.00	40.85	8.30	14.53
66		.00	82.33	77.20	2.29
70		.00	40.88	74.10	-14.83
74		.00	87.20	17.50	31.11
75		.00	40.27	17.50	10.16
90		.00	87.20	31.60	24.81
91		.00	40.27	31.60	3.87
100		.00	87.20	11.40	33.83
101		.00	40.27	28.50	5.25
109		.00	59.15	44.40	6.58
110		.00	52.94	44.40	3.81
143		.00	86.26	72.80	6.01
144		.00	839.81	74.20	341.72
156		.00	86.24	72.80	6.00
157		.00	839.89	74.20	341.75
165		.00	40.96	58.80	-7.96
204		.00	40.67	33.10	3.38
205		.00	40.67	71.90	-13.94
302		.00	835.71	34.20	357.74

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THE NET SYSTEM DEMAND = 110.00

SUMMARY OF INFLOWS(+) AND OUTFLOWS(-) FROM FIXED GRADE NODES

PIPE NUMBER	FLOWRATE
4	8524.42
158	-1783.24
161	-5855.16
600	-776.03

THE NET FLOW INTO THE SYSTEM FROM FIXED GRADE NODES = 8524.42

THE NET FLOW OUT OF THE SYSTEM INTO FIXED GRADE NODES = -8414.42

A SUMMARY OF CONDITIONS SPECIFIED FOR THE NEXT SIMULATION FOLLOWS

THE FOLLOWING SPECIFIC DEMAND CHANGES ARE MADE :

JUNCTION NUMBER	DEMAND
66	.00
70	.00
302	.00
165	.00
13	113.00

LINE 31 IS OPEN
 LINE 38 IS OPEN
 LINE 41 IS OPEN
 LINE 47 IS OPEN
 LINE 50 IS OPEN
 LINE 57 IS OPEN
 LINE 62 IS OPEN
 LINE 72 IS CLOSED
 LINE 73 IS CLOSED
 LINE 74 IS CLOSED
 LINE 88 IS OPEN
 LINE 92 IS OPEN
 LINE 97 IS OPEN
 LINE 101 IS OPEN
 LINE 109 IS OPEN
 LINE 116 IS OPEN
 LINE 120 IS OPEN

THE FOLLOWING CHANGES IN PIPE DATA ARE SPECIFIED

FOR PIPE NUMBER 1 THE VALUE OF THE FIXED GRADE IS CHANGED TO 14.0

FOR PIPE NUMBER 4 THE VALUE OF THE FIXED GRADE IS CHANGED TO 14.0

FOR PIPE NUMBER 600 THE VALUE OF THE FIXED GRADE IS CHANGED TO 26.5

PIPE NO.	NODE NOS.	LENGTH	DIAMETER	ROUGHNESS	MINOR LOSS K	FIXED GRADE
2	1 2	9.7	16.6	5.0	7.73	.00
5	4 5	9.7	16.6	5.0	7.73	.00
198	302 165	205.0	15.3	.2	2000.00	.00

THE RESULTS ARE OBTAINED AFTER 6 TRIALS WITH AN ACCURACY = .00465

UICSNRIO CHANGE 12:WORST CASE >10 MINUTE COOLING CHECK ;COPY OF U2NOPOWER CHANGE
 4 SCENARIO RUN ON MODEL SET UP AS UICALEN2;FOR SYSTEM LINEUP DETAILS OF U2NOPOWER
 CHANGE 4 SEE CALC G0050A-12 ATT 3;NOTE THIS RUN ONLY HAS 2 DGs(vs U2NOPOWER CH 4)

PIPE NO.	NODE NOS.	FLOWRATE	HEAD LOSS PUMP	HEAD MINOR LOSS	VELOCITY	HL/1000
LINE 4	1 IS CLOSED					
4	0 4	7095.78	.33	119.90	.00	34.05
16	12 13	113.00	.38	.00	.21	33.45
31	27 28	50.88	.03	.00	26.62	25.60
34	304 305	389.78	.49	.00	1.55	102.19
38	36 37	79.25	.06	.00	19.10	59.67

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41	38	39	77.98	.06	.00	18.49	5.92	57.85
47	41	42	79.22	.06	.00	19.08	6.01	59.62
50	43	44	77.73	.06	.00	18.37	5.90	57.48
57	49	50	11.76	.14	.00	8.44	5.21	137.25
62	53	54	12.97	.17	.00	4.10	5.75	165.49
LINE 72	IS	CLOSED						
LINE 73	IS	CLOSED						
LINE 74	IS	CLOSED						
79	66	70	.00	.00	.00	.00	.00	.00
88	74	75	91.82	.08	.00	9.05	6.97	79.20
92	76	77	93.15	.08	.00	9.31	7.07	81.43
97	81	82	94.33	.08	.00	9.55	7.16	83.43
101	83	84	91.06	.08	.00	8.90	6.91	77.94
105	88	68	470.20	1.12	.00	4.39	5.21	13.93
109	90	91	13.58	.18	.00	.56	6.02	180.75
116	96	97	13.56	.18	.00	1.68	6.01	180.11
120	100	101	72.72	.05	.00	1.89	5.52	50.59
128	109	110	1111.00	.03	.00	9.19	8.11	25.36
134	115	116	1062.29	.02	.00	1.87	7.76	23.25
LINE 146	IS	CLOSED						
LINE 152	IS	CLOSED						
166	143	144	1463.55	.03	750.52	.00	9.39	31.14
174	156	157	1460.23	.03	750.63	.00	9.37	31.01
179	148	149	45.38	4.62	.00	2.35	0.46	268.36
185	160	161	44.48	4.44	.00	2.25		258.13
197	170	171	2923.78	.02	.00	.20	.14	4.46
198	302	165	2923.78	.91	.00	818.89	5.14	4.46
LINE 205	IS	CLOSED						
LINE 213	IS	CLOSED						
LINE 218	IS	CLOSED						
LINE 224	IS	CLOSED						
233	203	204	.00	.00	.00	.00	.00	.00
234	204	205	.00	.00	.00	.00	.00	.00
235	70	205	.00	.00	.00	.00	.00	.00
501	86	301	370.34	.02	.00	39.26	4.11	8.82
503	46	303	314.18	.04	.00	40.17	3.48	6.45
600	17	0	935.86	.00	.00	90.41	1.10	.33

JUNCTION	NUMBER	DEMAND	GRADE LINE	ELEVATION	PRESSURE
1		.00	116.91	43.10	32.94
2		.00	116.91	42.40	33.26
14		.00	116.91	26.50	40.35
15		.00	116.91	26.50	40.35
16		.00	116.91	26.50	40.35
18		.00	116.10	36.30	35.62
23		.00	110.71	12.50	43.84
27		.00	102.88	11.00	41.01
28		.00	76.23	10.80	29.20
36		.00	108.94	17.50	40.81
37		.00	89.80	17.50	32.27
49		.00	103.65	8.30	42.56
50		.00	103.88	8.30	42.66
66		.00	40.10	77.20	-16.56
70		.00	40.10	74.10	-15.18
74		.00	105.12	17.50	39.11
75		.00	95.99	17.50	35.03

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90	.00	102.99	31.60	31.87
91	.00	102.25	31.60	31.53
100	.00	96.57	11.40	38.01
101	.00	94.63	28.50	29.52
109	.00	73.81	44.40	13.13
110	.00	64.59	44.40	9.01
143	.00	115.18	72.80	18.91
144	.00	865.66	74.20	353.26
156	.00	115.15	72.80	18.90
157	.00	865.75	74.20	353.29
165	.00	41.15	58.80	-7.88
204	.00	40.10	33.10	3.12
205	.00	40.10	71.90	-14.20
302	.00	860.96	34.20	369.01

THE NET SYSTEM DEMAND = 113.00

SUMMARY OF INFLOWS(+) AND OUTFLOWS(-) FROM FIXED GRADE NODES

PIPE NUMBER	FLOWRATE
4	7095.78
158	-2173.29
161	-3873.62
600	-935.86

THE NET FLOW INTO THE SYSTEM FROM FIXED GRADE NODES = 7095.78

THE NET FLOW OUT OF THE SYSTEM INTO FIXED GRADE NODES = -6982.78

A SUMMARY OF CONDITIONS SPECIFIED FOR THE NEXT SIMULATION FOLLOWS

THE FOLLOWING SPECIFIC DEMAND CHANGES ARE MADE :

JUNCTION NUMBER	DEMAND
13	113.00
66	.00
70	.00
302	.00
165	.00

THE FOLLOWING CHANGES IN PIPE DATA ARE SPECIFIED

FOR PIPE NUMBER 1 THE VALUE OF THE FIXED GRADE IS CHANGED TO 11.4

FOR PIPE NUMBER 4 THE VALUE OF THE FIXED GRADE IS CHANGED TO 11.4

PIPE NO.	NODE NOS.	LENGTH	DIAMETER	ROUGHNESS	MINOR LOSS K	FIXED GRADE
2	1 2	9.7	16.6	5.0	6.48	.00
5	4 5	9.7	16.6	5.0	6.48	.00
198	302 165	205.0	15.3	.2	1900.00	.00

THE RESULTS ARE OBTAINED AFTER 2 TRIALS WITH AN ACCURACY = .00015

UISCNRI0 CHANGE 13:ALTERNATE WORST CASE >10 MINUTE COOLNG CHECK;COPY OF U2TYFOON
 CHANGE 2 RUN ON MODEL SET UP AS U1CALBN2;FOR SYSTEM LINEUP DETAILS OF U2TYFOON
 CHANGE 2 SEE CALC G0050A-12 ATT 5

PIPE NO.	NODE NOS.	FLOWRATE	HEAD LOSS	PUMP HEAD	MINOR LOSS	VELOCITY	HL/1000
LINE 1	IS CLOSED						
4	0 4	7128.60	.03	119.15	.00	10.53	34.37
16	12 13	113.00	.38	.00	.21	3.70	33.45
31	27 28	50.34	.03	.00	26.06	3.82	25.09
34	304 305	384.88	.48	.00	1.51	10.77	99.70
38	36 37	78.53	.06	.00	18.75	5.96	58.63
41	38 39	77.27	.06	.00	18.15	5.86	56.84
47	41 42	78.49	.06	.00	18.73	5.96	58.58
50	43 44	77.02	.06	.00	18.03	5.84	56.48
57	49 50	10.91	.12	.00	7.27	4.84	119.03
62	53 54	12.32	.15	.00	3.71	5.46	150.10
LINE 72	IS CLOSED						
LINE 73	IS CLOSED						
LINE 74	IS CLOSED						
79	66 70	.00	.00	.00	.00	.00	.00
88	74 75	91.07	.08	.00	8.90	6.91	77.97
92	76 77	92.39	.08	.00	9.16	7.01	80.16
97	81 82	93.56	.08	.00	9.39	7.10	82.13
101	83 84	90.32	.08	.00	8.75	6.85	76.73
105	88 68	462.99	1.08	.00	4.25	5.13	13.52
109	90 91	12.81	.16	.00	.50	5.68	161.67
116	96 97	12.79	.16	.00	1.50	5.67	161.05
120	100 101	70.05	.05	.00	1.76	5.32	47.10
128	109 110	1102.10	.02	.00	9.05	8.05	24.97
134	115 116	1053.77	.02	.00	1.84	7.69	22.89

ATTACHMENT E: UISCNRI0 RESULTS FILE

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LINE 146 IS CLOSED								
LINE 152 IS CLOSED								
166 143 144	1498.81	.03	749.28	.00	9.61	32.62		
174 156 157	1495.43	.03	749.40	.00	9.59	32.48		
179 148 149	44.93	4.53	.00	2.30	9.36	263.24		
185 160 161	44.04	4.36	.00	2.21	9.18	253.20		
197 170 171	2994.24	.02	.00	.21	5.26	4.67		
198 302 165	2994.24	.96	.00	815.89	5.26	4.67		
LINE 205 IS CLOSED								
LINE 213 IS CLOSED								
LINE 218 IS CLOSED								
LINE 224 IS CLOSED								
233 203 204	.00	.00	.00	.00	.00	.00		
234 204 205	.00	.00	.00	.00	.00	.00		
235 70 205	.00	.00	.00	.00	.00	.00		
501 86 301	367.34	.02	.00	38.62	4.07	8.69		
503 46 303	311.31	.04	.00	39.44	3.45	6.34		
600 17 0	928.65	.00	.00	89.02	1.09	.33		

JUNCTION NUMBER	DEMAND	GRADE LINE	ELEVATION	PRESSURE
1	.00	115.52	43.10	32.32
2	.00	115.52	42.40	32.64
14	.00	115.52	26.50	39.73
15	.00	115.52	26.50	39.73
16	.00	115.52	26.50	39.73
18	.00	114.70	36.30	34.99
23	.00	109.46	12.50	43.28
27	.00	101.60	11.00	40.44
28	.00	75.51	10.80	28.88
36	.00	107.72	17.50	40.27
37	.00	88.91	17.50	31.87
49	.00	103.35	8.30	42.42
50	.00	95.96	8.30	39.13
66	.00	40.10	77.20	-16.56
70	.00	40.10	74.10	-15.18
74	.00	103.95	17.50	38.59
75	.00	94.97	17.50	34.58
90	.00	97.21	31.60	29.28
91	.00	96.55	31.60	28.99
100	.00	92.75	11.40	36.31
101	.00	90.95	28.50	27.87
109	.00	73.09	44.40	12.81
110	.00	64.02	44.40	8.76
143	.00	113.73	72.80	18.27
144	.00	862.98	74.20	352.06
156	.00	113.70	72.80	18.26
157	.00	863.07	74.20	352.10
165	.00	41.20	58.80	-7.86
204	.00	40.10	33.10	3.12
205	.00	40.10	71.90	-14.19
302	.00	858.05	34.20	367.71

THE NET SYSTEM DEMAND = 113.00

SUMMARY OF INFLOWS(+) AND OUTFLOWS(-) FROM FIXED GRADE NODES

ATTACHMENT E: UISCNRIO RESULTS FILE

PIPE NUMBER	FLOWRATE
4	7128.60
158	-2155.87
161	-3931.08
600	-928.65

THE NET FLOW INTO THE SYSTEM FROM FIXED GRADE NODES = 7128.60
THE NET FLOW OUT OF THE SYSTEM INTO FIXED GRADE NODES = -7015.60

FLOWRATE IS EXPRESSED IN GPM AND PRESSURE IN PSIG

A SUMMARY OF THE ORIGINAL DATA FOLLOWS

THE DARCY WEISBACH HEAD LOSS EQUATION IS USED, THE KINEMATIC VIS. = .0000070

THE SPECIFIC GRAVITY OF THIS LIQUID = 1.03

PIPE NO.	NODE NOS.	LENGTH (FEET)	DIAMETER (INCHES)	ROUGHNESS	MINOR LOSS K	FIXED GRADE
1	0 1	1.0	16.6	5.0	.00	14.00
LINE 1	PUMP DATA (HEAD-FLOW):	200.0		.0	135.0 6400.0	90.0 8300.0
LINE 1	IS CLOSED					
2	1 2	9.7	16.6	5.0	1.83	
3	2 3	15.9	18.6	5.0	2.91	
4	0 4	1.0	16.6	5.0	.00	14.00
LINE 4	PUMP DATA (HEAD-FLOW):	200.0		.0	135.0 6400.0	90.0 8300.0
5	4 5	9.7	16.6	5.0	1.83	
6	5 6	15.9	18.6	5.0	2.91	
7	3 6	6.0	28.5	5.0	.06	
8	6 7	6.0	28.5	5.0	.06	
9	7 8	308.8	28.5	5.0	.48	
10	8 18	371.0	28.5	5.0	.84	
11	8 9	2.7	16.6	5.0	.33	
12	9 10	63.7	17.3	.2	.60	
13	10 103	124.3	16.6	5.0	.52	
14	7 11	1.4	3.5	5.0	.71	
15	11 12	3.8	3.5	5.0	3.69	
16	12 13	11.3	3.5	5.0	.99	
17	14 3	7.0	28.5	5.0	.06	
18	15 14	6.1	28.5	5.0	.06	
19	16 15	7.0	28.5	5.0	.06	
20	17 16	2.3	28.5	5.0	.00	
21	306 19	2.3	29.3	.2	.07	
22	19 21	9.1	22.5	5.0	.79	
23	19 20	11.4	29.3	.2	1.49	
24	20 55	24.1	19.3	.2	.68	
25	18 22	28.1	6.1	.2	2.76	
26	22 23	15.5	6.1	.2	.30	
27	23 24	6.5	6.1	.2	.18	
28	24 25	111.6	6.1	.2	2.63	
29	25 26	67.3	3.8	.2	.22	
30	26 27	40.8	1.7	.2	3.46	
31	27 28	1.0	2.3	.2	115.00	
LINE 31	IS CLOSED					
32	28 29	31.5	1.7	.2	33.18	
33	29 30	1.2	3.8	.2	17.02	

ATTACHMENT F: UISCNRIO INPUT DATA FILE

34	304	305	4.8	3.8	.2	.84
35	23	32	13.1	6.1	.2	.81
36	33	34	1.3	3.0	.2	.54
37	34	36	8.2	2.3	.2	.74
38	36	37	1.0	2.3	.2	34.00
39	37	40	7.0	2.3	.2	1.13
40	34	38	7.2	2.3	.2	1.17
41	38	39	1.0	2.3	.2	34.00
42	39	40	7.1	2.3	.2	2.03
43	40	45	5.0	3.0	.2	.69
44	32	33	5.0	6.1	.2	.48
45	33	35	2.8	3.0	.2	.79
46	35	41	9.2	2.3	.2	.74
47	41	42	1.0	2.3	.2	34.00
48	42	45	7.0	2.3	.2	2.06
49	35	43	7.9	2.3	.2	1.76
50	43	44	1.0	2.3	.2	34.00
51	44	46	8.0	2.3	.2	2.60
52	45	46	1.5	6.1	.2	.12
53	303	47	20.8	6.1	.2	.93
54	47	30	200.0	6.1	.2	3.33
55	24	48	3.5	1.4	.2	.85
56	48	49	11.0	1.0	.2	11.64
57	49	50	1.0	1.0	.2	20.00
58	50	51	17.2	1.0	.2	125.00
59	51	52	1.1	1.4	.2	.90
60	52	47	2.9	1.4	.2	1.73
61	48	53	19.0	1.0	.2	12.94
62	53	54	1.0	1.0	.2	8.00
63	54	51	9.0	1.0	.2	100.00
64	31	139	47.4	18.6	5.0	.08
65	22	71	125.1	6.1	.2	3.02
66	55	56	104.2	18.6	5.0	12.71
67	56	57	14.9	18.6	5.0	.60
68	57	58	5.0	18.6	5.0	.30
69	57	59	16.1	14.6	5.0	.67
70	58	60	16.1	12.6	5.0	.47
71	58	61	18.3	14.6	5.0	1.02
72	59	62	1.0	14.6	.2	21.80
73	60	63	1.0	14.6	.2	21.80
74	61	64	1.0	14.6	.2	21.80
75	62	65	12.5	15.3	.2	.51
76	63	65	10.9	13.3	.2	.37
77	64	66	13.3	15.3	.2	.87
78	65	66	5.7	15.3	.2	.08
79	66	70	29.5	15.3	.2	218.95
LINE 79 IS CLOSED						
80	205	69	9.3	15.3	.2	.62
81	69	68	30.2	28.5	5.0	1.82
82	68	137	36.9	28.5	5.0	.04
83	71	98	51.2	6.1	.2	2.85
84	98	67	2.9	6.1	.2	.63
85	71	72	8.2	6.1	.2	.36
86	72	300	37.1	6.1	.2	1.17
87	73	74	9.8	2.3	.2	1.35
88	74	75	1.0	2.3	.2	12.00
LINE 88 IS CLOSED						

ATTACHMENT F: U1SCNRIO INPUT DATA FILE

89	75	78	7.2	2.3	.2	1.76
90	73	79	.9	6.1	.2	.12
91	79	76	8.5	2.3	.2	1.08
92	76	77	1.0	2.3	.2	12.00
LINE 92 IS CLOSED						
93	77	78	8.6	2.3	.2	1.51
94	78	85	4.7	3.0	.2	.57
95	79	80	1.2	3.0	.2	1.13
96	80	81	9.1	2.3	.2	1.01
97	81	82	1.0	2.3	.2	12.00
LINE 97 IS CLOSED						
98	82	85	7.5	2.3	.2	.81
99	85	86	4.2	6.1	.2	.42
100	80	83	9.2	2.3	.2	1.35
101	83	84	1.0	2.3	.2	12.00
LINE 101 IS CLOSED						
102	84	86	8.4	2.3	.2	1.62
103	301	87	27.5	6.1	.2	1.17
104	87	88	606.1	6.1	.2	4.82
105	88	68	80.2	6.1	.2	10.40
106	72	102	12.5	1.7	.2	.60
107	102	89	2.9	1.4	.2	.73
108	89	90	13.0	1.0	.2	12.28
109	90	91	1.0	1.0	.2	1.00
LINE 109 IS CLOSED						
110	91	92	24.0	1.0	.2	75.00
111	92	93	.9	1.4	.2	.22
112	93	94	2.9	1.4	.2	1.35
113	94	95	18.7	1.7	.2	1.20
114	95	87	.9	1.7	.2	1.67
115	89	96	20.3	1.0	.2	12.46
116	96	97	1.0	1.0	.2	3.00
LINE 116 IS CLOSED						
117	97	92	11.2	1.0	.2	75.00
118	98	99	101.9	3.8	.2	1.46
119	99	100	35.0	1.7	.2	3.57
120	100	101	1.0	2.3	.2	4.00
LINE 120 IS CLOSED						
121	101	88	34.5	2.3	.2	100.00
122	120	104	31.0	16.6	5.0	.89
123	104	105	5.4	16.6	5.0	.89
124	105	106	.8	16.6	5.0	.00
125	104	107	56.3	5.6	5.0	4.01
126	107	108	12.7	5.6	5.0	.73
127	108	109	1.9	7.5	5.0	.76
128	109	110	1.0	7.5	.2	9.00
LINE 128 IS CLOSED						
129	110	111	1.9	7.5	5.0	.98
130	111	112	79.0	5.6	5.0	3.28
131	105	113	79.8	5.6	5.0	4.34
132	113	114	12.0	5.6	5.0	.73
133	114	115	1.9	7.5	5.0	.76
134	115	116	1.0	7.5	.2	2.00
LINE 134 IS CLOSED						
135	116	117	1.9	7.5	5.0	.98
136	117	118	100.4	5.6	5.0	3.61
137	119	118	.8	16.6	5.0	.00

138	118	112	.8	16.6	5.0	.07			
139	112	136	26.8	16.6	5.0	.45			
140	103	120	18.9	16.6	5.0	35.41			
141	103	121	12.0	16.6	5.0	35.41			
142	121	122	3.1	5.6	5.0	.00			
143	120	123	58.0	5.6	5.0	4.00			
144	123	124	13.7	5.6	5.0	.73			
145	124	125	1.7	7.5	5.0	.76			
146	125	126	1.0	8.0	.2	9.00			
LINE 146	IS	CLOSED							
147	126	127	1.9	7.5	5.0	1.48			
148	127	128	74.8	5.6	5.0	2.68			
149	121	129	54.5	5.6	5.0	4.01			
150	129	130	16.3	5.6	5.0	.91			
151	130	131	1.7	7.5	5.0	.50			
152	131	132	1.0	8.0	.2	9.00			
LINE 152	IS	CLOSED							
153	132	133	1.9	7.5	5.0	.98			
154	133	134	75.7	5.6	5.0	3.28			
155	135	134	2.3	16.6	5.0	.00			
156	134	128	30.8	16.6	5.0	.07			
157	128	136	4.3	16.6	5.0	.45			
158	136	0	414.1	16.6	5.0	.96	28.90		
159	137	138	16.4	28.5	5.0	.92			
160	139	138	126.7	18.6	5.0	.64			
161	138	0	286.2	34.5	5.0	1.13	40.00		
162	21	140	27.2	22.5	5.0	.20			
163	140	141	6.5	12.6	5.0	.34			
164	141	142	4.3	12.6	5.0	.12			
165	142	143	4.3	8.0	.2	.32			
166	143	144	1.0	8.0	.2	.00			
LINE 166	PUMP	DATA (HEAD-FLOW):	775.0	.0	580.0	4000.0	500.0	4725.0	
167	144	145	9.9	12.0	.2	3.76			
168	145	146	16.7	12.0	.2	.93			
169	140	153	16.0	22.5	5.0	.06			
170	153	173	21.5	22.5	5.0	.30			
171	153	154	6.5	12.6	5.0	.44			
172	154	155	4.3	12.6	5.0	.12			
173	155	156	4.3	8.0	.2	.32			
174	156	157	1.0	8.0	.2	.00			
LINE 174	PUMP	DATA (HEAD-FLOW):	775.0	.0	580.0	4000.0	500.0	4725.0	
175	157	158	9.8	12.0	.2	3.76			
176	158	146	31.4	12.0	.2	1.07			
177	141	147	.8	1.7	.2	.20			
178	147	148	.5	1.7	.2	.07			
179	148	149	17.2	1.4	.2	1.69			
180	149	150	.7	1.7	.2	26.27			
181	150	151	2.2	1.4	.2	27.12			
182	151	152	19.9	1.4	.2	2.42			
183	154	159	.8	1.7	5.0	.69			
184	159	160	.5	1.7	.2	.07			
185	160	161	17.2	1.4	.2	1.69			
186	161	162	1.0	1.7	.2	26.57			
187	162	163	2.7	1.4	.2	28.70			
188	163	164	19.9	1.4	.2	2.21			
189	193	164	21.2	3.0	.2	.32			</

ATTACHMENT F: UISCNRIO INPUT DATA FILE

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191	152	165	117.8	3.0	.2	4.45
192	146	166	156.0	16.0	.2	1.15
193	166	167	18.7	16.0	.2	.44
194	167	168	10.5	15.3	.2	.14
195	168	169	2.5	15.3	.2	.00
196	169	170	1.0	19.3	.2	11.50
197	170	171	5.0	15.3	.2	.48
198	302	165	205.0	15.3	.2	759.83
LINE 198 IS CLOSED						
199	165	172	7.5	19.3	.2	.00
200	172	31	31.0	18.6	5.0	.07
201	173	174	1.0	12.6	5.0	.00
202	174	175	4.7	13.3	.2	.10
203	175	176	4.3	13.3	.2	.12
204	176	177	4.2	8.0	.2	.32
205	177	178	1.0	8.0	.2	.00
LINE 205 PUMP DATA (HEAD-FLOW): 775.0 .0 580.0 4000.0 500.0 4725.0						
LINE 205 IS CLOSED						
206	178	179	9.8	12.0	.2	3.76
207	179	180	27.9	12.0	.2	.46
208	173	181	16.0	22.5	5.0	.12
209	181	182	.4	12.6	5.0	.00
210	182	183	4.8	13.3	.2	.00
211	183	184	4.4	13.3	.2	.12
212	184	185	4.2	8.0	.2	.32
213	185	186	1.0	8.0	.2	.00
LINE 213 PUMP DATA (HEAD-FLOW): 775.0 .0 580.0 4000.0 500.0 4725.0						
LINE 213 IS CLOSED						
214	186	187	10.4	12.0	.2	3.76
215	187	180	17.4	12.0	.2	.29
216	175	188	1.0	1.7	.2	.49
217	188	189	.3	1.4	.2	.07
218	189	190	16.9	1.4	.2	1.69
LINE 218 IS CLOSED						
219	190	191	1.0	1.7	.2	25.00
220	191	192	2.3	1.4	.2	15.00
221	192	193	19.5	1.4	.2	2.44
222	183	194	.4	1.7	.2	.49
223	194	195	.7	1.4	.2	.07
224	195	196	16.4	1.4	.2	1.69
LINE 224 IS CLOSED						
225	196	197	1.0	1.7	.2	10.00
226	197	198	2.9	1.4	.2	15.00
227	198	193	39.2	1.4	.2	5.21
228	180	199	212.5	15.3	.2	1.33
229	199	200	2.5	15.3	.2	.25
230	200	201	2.5	19.3	.2	.00
231	201	202	1.0	19.3	.2	11.50
232	202	203	2.5	19.3	.2	.19
233	203	204	2.5	15.3	.2	.00
234	204	205	235.1	15.3	.2	1814.60
235	70	205	.7	15.3	.2	.48
500	300	73	4.8	6.1	.2	.76
501	86	301	2.3	6.1	.2	150.00
502	171	302	.4	15.3	.2	.00
503	46	303	5.8	6.1	.2	213.26
504	30	304	1.5	3.8	.2	.00

ATTACHMENT F: UISCNRIO INPUT DATA FILE

505	305	31	32.9	5.6	5.0	1.94	
506	18	306	103.8	28.5	5.0	.08	
600	17	0	1.0	18.6	5.0	4800.00	116.10

A SUCCESSFUL GEOMETRIC VERIFICATION HAS BEEN COMPLETED

JUNCTION NUMBER	DEMAND	ELEVATION	CONNECTING	PIPES
1	.00	43.10	1	2
2	.00	42.40	2	3
3	.00	26.50	3	7 17
4	.00	43.10	4	5
5	.00	42.40	5	6
6	.00	26.50	6	7 8
7	.00	26.50	8	9 14
8	.00	26.50	9	10 11
9	.00	29.20	11	12
10	.00	31.80	12	13
11	.00	24.60	14	15
12	.00	24.60	15	16
13	118.00	24.60	16	
14	.00	26.50	17	18
15	.00	26.50	18	19
16	.00	26.50	19	20
17	.00	26.50	20	600
18	.00	36.30	10	25 506
19	.00	81.50	21	22 23
20	.00	81.50	23	24
21	.00	81.50	22	162
22	.00	19.10	25	26 65
23	.00	12.50	26	27 35
24	.00	12.50	27	28 55
25	.00	33.80	28	29
26	.00	34.50	29	30
27	.00	11.00	30	31
28	.00	10.80	31	32
29	.00	32.30	32	33
30	.00	23.20	33	54 504
31	.00	35.50	64	200 505
32	.00	12.50	35	44
33	.00	12.50	36	44 45
34	.00	12.50	36	37 40
35	.00	12.50	45	46 49
36	.00	17.50	37	38
37	.00	17.50	38	39
38	.00	17.50	40	41
39	.00	17.50	41	42
40	.00	14.20	39	42 43
41	.00	17.40	46	47
42	.00	17.40	47	48
43	.00	17.40	49	50
44	.00	17.40	50	51
45	.00	14.20	43	48 52
46	.00	14.20	51	52 503
47	.00	10.80	53	54 60
48	.00	12.50	55	56 61
49	.00	8.30	56	57

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50	.00	8.30	57	58	
51	.00	10.80	58	59	63
52	.00	10.80	59	60	
53	.00	8.30	61	62	
54	.00	8.30	62	63	
55	.00	81.50	24	66	
56	.00	81.50	66	67	
57	.00	79.00	67	68	69
58	.00	79.00	68	70	71
59	.00	74.80	69	72	
60	.00	74.80	70	73	
61	.00	74.80	71	74	
62	.00	74.80	72	75	
63	.00	74.80	73	76	
64	.00	74.80	74	77	
65	.00	77.20	75	76	78
66	4000.00	77.20	77	78	79
67	.00	16.80	84		
68	.00	35.50	81	82	105
69	.00	65.80	80	81	
70	-4000.00	74.10	79	235	
71	.00	.10	65	83	85
72	.00	.10	85	86	106
73	.00	16.10	87	90	500
74	.00	17.50	87	88	
75	.00	17.50	88	89	
76	.00	17.50	91	92	
77	.00	17.50	92	93	
78	.00	14.20	89	93	94
79	.00	16.10	90	91	95
80	.00	16.10	95	96	100
81	.00	17.40	96	97	
82	.00	17.60	97	98	
83	.00	17.40	100	101	
84	.00	17.60	101	102	
85	.00	14.20	94	98	99
86	.00	14.20	99	102	501
87	.00	20.90	103	104	114
88	.00	33.20	104	105	121
89	.00	14.20	107	108	115
90	.00	31.60	108	109	
91	.00	31.60	109	110	
92	.00	12.10	110	111	117
93	.00	12.10	111	112	
94	.00	23.00	112	113	
95	.00	21.00	113	114	
96	.00	8.30	115	116	
97	.00	8.30	116	117	
98	.00	16.80	83	84	118
99	.00	34.50	118	119	
100	.00	11.40	119	120	
101	.00	28.50	120	121	
102	.00	14.20	106	107	
103	.00	34.50	13	140	141
104	.00	34.50	122	123	125
105	.00	34.50	123	124	131
106	.00	34.50	124		

ATTACHMENT F: UISCNRIO INPUT DATA FILE

107	.00	43.80	125	126	
108	.00	42.90	126	127	
109	.00	44.40	127	128	
110	.00	44.40	128	129	
111	.00	44.50	129	130	
112	.00	34.50	130	138	139
113	.00	43.80	131	132	
114	.00	42.90	132	133	
115	.00	44.40	133	134	
116	.00	44.40	134	135	
117	.00	44.30	135	136	
118	.00	34.50	136	137	138
119	.00	34.50	137		
120	.00	34.50	122	140	143
121	.00	34.50	141	142	149
122	.00	34.50	142		
123	.00	47.30	143	144	
124	.00	43.80	144	145	
125	.00	44.40	145	146	
126	.00	44.40	146	147	
127	.00	43.80	147	148	
128	.00	34.50	148	156	157
129	.00	43.80	149	150	
130	.00	43.80	150	151	
131	.00	44.40	151	152	
132	.00	44.40	152	153	
133	.00	43.80	153	154	
134	.00	34.50	154	155	156
135	.00	34.50	155		
136	.00	34.50	139	157	158
137	.00	19.30	82	159	
138	.00	19.30	159	160	161
139	.00	19.30	64	160	
140	.00	81.50	162	163	169
141	.00	75.00	163	164	177
142	.00	72.80	164	165	
143	.00	72.80	165	166	
144	.00	74.20	166	167	
145	.00	77.50	167	168	
146	.00	81.20	168	176	192
147	.00	75.00	177	178	
148	.00	75.00	178	179	
149	.00	73.80	179	180	
150	.00	73.90	180	181	
151	.00	74.30	181	182	
152	.00	63.50	182	190	191
153	.00	81.50	169	170	171
154	.00	75.00	171	172	183
155	.00	72.80	172	173	
156	.00	72.80	173	174	
157	.00	74.20	174	175	
158	.00	77.50	175	176	
159	.00	75.00	183	184	
160	.00	75.00	184	185	
161	.00	73.80	185	186	
162	.00	73.90	186	187	
163	.00	74.30	187	188	

ATTACHMENT F: UISCNRIO INPUT DATA FILE

164	.00	63.50	188	189	190
165	-2800.00	58.80	191	198	199
166	.00	46.80	192	193	
167	.00	34.20	193	194	
168	.00	34.20	194	195	
169	.00	34.20	195	196	
170	.00	34.20	196	197	
171	.00	34.20	197	502	
172	.00	51.00	199	200	
173	.00	81.50	170	201	208
174	.00	79.60	201	202	
175	.00	75.00	202	203	216
176	.00	72.80	203	204	
177	.00	72.80	204	205	
178	.00	74.10	205	206	
179	.00	77.50	206	207	
180	.00	77.50	207	215	228
181	.00	81.50	208	209	
182	.00	79.80	209	210	
183	.00	75.00	210	211	222
184	.00	72.80	211	212	
185	.00	72.80	212	213	
186	.00	74.10	213	214	
187	.00	77.50	214	215	
188	.00	75.00	216	217	
189	.00	75.00	217	218	
190	.00	73.40	218	219	
191	.00	73.40	219	220	
192	.00	74.30	220	221	
193	.00	63.50	189	221	227
194	.00	75.00	222	223	
195	.00	75.00	223	224	
196	.00	73.40	224	225	
197	.00	73.40	225	226	
198	.00	74.08	226	227	
199	.00	33.10	228	229	
200	.00	33.10	229	230	
201	.00	33.10	230	231	
202	.00	33.10	231	232	
203	.00	33.10	232	233	
204	.00	33.10	233	234	
205	.00	71.90	80	234	235
300	.00	16.00	86	500	
301	.00	14.20	103	501	
302	2800.00	34.20	198	502	
303	.00	12.50	53	503	
304	.00	33.20	34	504	
305	.00	33.20	34	505	
306	.00	81.50	21	506	

OUTPUT SELECTION: THE FOLLOWING RESULTS ARE OUTPUT
 RESULTS ARE OUTPUT FOR ALL PIPES WITH PUMPS - CLOSED PIPES ARE NOTED
 RESULTS ARE OUTPUT FOR THE FOLLOWING PIPES : 1 4 16 31 34 38 41 47 50 57 62
 72 73 74 79 88 92 97 101 105
 RESULTS ARE OUTPUT FOR THE FOLLOWING PIPES : 109 116 120 128 134 146 152 166 174 179 185
 197 198 205 213 218 224 233 234 235
 RESULTS ARE OUTPUT FOR THE FOLLOWING PIPES : 501 503 600

RESULTS ARE OUTPUT FOR THE FOLLOWING JUNCTION NODES : 1 2 14 15 16 27 28 36 37
 49 50 66 70 74 75
 RESULTS ARE OUTPUT FOR THE FOLLOWING JUNCTION NODES : 90 91 100 101 109 110 143 144 156
 157 18 23 204 205 302
 RESULTS ARE OUTPUT FOR THE FOLLOWING JUNCTION NODES : 165

THIS SYSTEM HAS 243 PIPES WITH 212 JUNCTIONS , 27 LOOPS AND 5 FGNS

TERMINATION DUE EITHER TO THE DETECTION OF AN ERROR OR USER INSTRUCTIONS

A SUMMARY OF CONDITIONS SPECIFIED FOR THE NEXT SIMULATION FOLLOWS

THE FOLLOWING SPECIFIC DEMAND CHANGES ARE MADE :

JUNCTION NUMBER	DEMAND
13	110.00
66	.00
70	.00
165	.00
302	.00

LINE 31 IS OPEN
 LINE 79 IS OPEN
 LINE 88 IS OPEN
 LINE 92 IS OPEN
 LINE 97 IS OPEN
 LINE 101 IS OPEN
 LINE 109 IS OPEN
 LINE 116 IS OPEN
 LINE 120 IS OPEN
 LINE 128 IS OPEN
 LINE 134 IS OPEN
 LINE 198 IS OPEN

THE FOLLOWING CHANGES IN PIPE DATA ARE SPECIFIED

FOR PIPE NUMBER 600 THE VALUE OF THE FIXED GRADE IS CHANGED TO 26.5

PIPE NO.	NODE NOS.	LENGTH	DIAMETER	ROUGHNESS	MINOR LOSS K	FIXED GRADE
2	1 2	9.7	16.6	5.0	1.59	.00
5	4 5	9.7	16.6	5.0	1.59	.00
24	20 55	24.1	19.3	.2	420.08	.00
79	66 70	29.5	15.3	.2	85.93	.00
198	302 165	205.0	15.3	.2	2192.66	.00

A SUMMARY OF CONDITIONS SPECIFIED FOR THE NEXT SIMULATION FOLLOWS

THE FOLLOWING SPECIFIC DEMAND CHANGES ARE MADE :

JUNCTION NUMBER	DEMAND
66	4000.00
70	-4000.00
302	2800.00
165	-2800.00
13	124.00

LINE 31 IS CLOSED
LINE 79 IS CLOSED
LINE 88 IS CLOSED
LINE 92 IS CLOSED
LINE 97 IS CLOSED
LINE 101 IS CLOSED
LINE 109 IS CLOSED
LINE 116 IS CLOSED
LINE 120 IS CLOSED
LINE 128 IS CLOSED
LINE 134 IS CLOSED
LINE 198 IS CLOSED

THE FOLLOWING CHANGES IN PIPE DATA ARE SPECIFIED

FOR PIPE NUMBER 1 THE VALUE OF THE FIXED GRADE IS CHANGED TO 22.0
FOR PIPE NUMBER 4 THE VALUE OF THE FIXED GRADE IS CHANGED TO 22.0
FOR PIPE NUMBER 600 THE VALUE OF THE FIXED GRADE IS CHANGED TO 116.1

PIPE NO.	NODE NOS.	LENGTH	DIAMETER	ROUGHNESS	MINOR LOSS K	FIXED GRADE
2	1 2	9.7	16.6	5.0	1.78	.00
5	4 5	9.7	16.6	5.0	1.78	.00
24	20 55	24.1	19.3	.2	.68	.00

A SUMMARY OF CONDITIONS SPECIFIED FOR THE NEXT SIMULATION FOLLOWS

THE FOLLOWING SPECIFIC DEMAND CHANGES ARE MADE :

JUNCTION NUMBER	DEMAND
66	.00
70	.00
302	.00
165	.00
13	110.00

LINE 31 IS OPEN
LINE 88 IS OPEN
LINE 92 IS OPEN
LINE 97 IS OPEN
LINE 101 IS OPEN
LINE 109 IS OPEN
LINE 116 IS OPEN

LINE 120 IS OPEN
 LINE 128 IS OPEN
 LINE 134 IS OPEN
 LINE 79 IS OPEN
 LINE 198 IS OPEN

THE FOLLOWING CHANGES IN PIPE DATA ARE SPECIFIED

FOR PIPE NUMBER 600 THE VALUE OF THE FIXED GRADE IS CHANGED TO 26.5

PIPE NO.	NODE NOS.	LENGTH	DIAMETER	ROUGHNESS	MINOR LOSS K	FIXED GRADE
2	1 2	9.7	16.6	5.0	1.56	.00
5	4 5	9.7	16.6	5.0	1.56	.00
24	20 55	24.1	19.3	.2	420.08	.00
79	66 70	29.5	15.3	.2	91.88	.00
198	302 165	205.0	15.3	.2	2204.74	.00

A SUMMARY OF CONDITIONS SPECIFIED FOR THE NEXT SIMULATION FOLLOWS

THE FOLLOWING SPECIFIC DEMAND CHANGES ARE MADE :

JUNCTION NUMBER	DEMAND
13	168.00
66	4000.00
70	-4000.00
302	2800.00
165	-2800.00

LINE 31 IS CLOSED
 LINE 38 IS CLOSED
 LINE 41 IS CLOSED
 LINE 47 IS CLOSED
 LINE 50 IS CLOSED
 LINE 57 IS CLOSED
 LINE 62 IS CLOSED
 LINE 79 IS CLOSED
 LINE 88 IS CLOSED
 LINE 92 IS CLOSED
 LINE 97 IS CLOSED
 LINE 101 IS CLOSED
 LINE 109 IS CLOSED
 LINE 116 IS CLOSED
 LINE 120 IS CLOSED
 LINE 128 IS CLOSED
 LINE 134 IS CLOSED
 LINE 198 IS CLOSED

THE FOLLOWING CHANGES IN PIPE DATA ARE SPECIFIED

FOR PIPE NUMBER 1 THE VALUE OF THE FIXED GRADE IS CHANGED TO 42.0

FOR PIPE NUMBER 4 THE VALUE OF THE FIXED GRADE IS CHANGED TO 42.0

FOR PIPE NUMBER 600 THE VALUE OF THE FIXED GRADE IS CHANGED TO 116.1

PIPE NO.	NODE NOS.	LENGTH	DIAMETER	ROUGHNESS	MINOR LOSS K	FIXED GRADE
2	1 2	9.7	16.6	5.0	1.79	.00
5	4 5	9.7	16.6	5.0	1.79	.00
24	20 55	24.1	19.3	.2	.68	.00

A SUMMARY OF CONDITIONS SPECIFIED FOR THE NEXT SIMULATION FOLLOWS

THE FOLLOWING SPECIFIC DEMAND CHANGES ARE MADE :

JUNCTION NUMBER	DEMAND
13	110.00
66	.00
70	.00
302	.00
165	.00

LINE 79 IS OPEN
 LINE 128 IS OPEN
 LINE 134 IS OPEN
 LINE 198 IS OPEN

THE FOLLOWING CHANGES IN PIPE DATA ARE SPECIFIED

FOR PIPE NUMBER 600 THE VALUE OF THE FIXED GRADE IS CHANGED TO 26.5

PIPE NO.	NODE NOS.	LENGTH	DIAMETER	ROUGHNESS	MINOR LOSS K	FIXED GRADE
2	1 2	9.7	16.6	5.0	1.47	.00
5	4 5	9.7	16.6	5.0	1.47	.00
79	66 70	29.5	15.3	.2	119.25	.00
198	302 165	205.0	15.3	.2	2261.08	.00

A SUMMARY OF CONDITIONS SPECIFIED FOR THE NEXT SIMULATION FOLLOWS

THE FOLLOWING SPECIFIC DEMAND CHANGES ARE MADE :

JUNCTION NUMBER	DEMAND
13	179.00
66	.00
70	.00
302	4100.00
165	-4100.00

LINE 38 IS OPEN
 LINE 41 IS OPEN
 LINE 47 IS OPEN
 LINE 50 IS OPEN
 LINE 57 IS OPEN
 LINE 62 IS OPEN
 LINE 72 IS CLOSED
 LINE 73 IS CLOSED

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LINE 74 IS CLOSED
LINE 128 IS CLOSED
LINE 134 IS CLOSED
LINE 198 IS CLOSED

THE FOLLOWING CHANGES IN PIPE DATA ARE SPECIFIED

FOR PIPE NUMBER 1 THE VALUE OF THE FIXED GRADE IS CHANGED TO 11.4
FOR PIPE NUMBER 4 THE VALUE OF THE FIXED GRADE IS CHANGED TO 11.4
FOR PIPE NUMBER 600 THE VALUE OF THE FIXED GRADE IS CHANGED TO 116.1

PIPE NO.	NODE NOS.	LENGTH	DIAMETER	ROUGHNESS	MINOR LOSS K	FIXED GRADE
2	1 2	9.7	16.6	5.0	2.77	.00
5	4 5	9.7	16.6	5.0	2.77	.00

A SUMMARY OF CONDITIONS SPECIFIED FOR THE NEXT SIMULATION FOLLOWS

THE FOLLOWING SPECIFIC DEMAND CHANGES ARE MADE :

JUNCTION NUMBER	DEMAND
13	110.00
66	.00
70	.00
165	.00
302	.00

LINE 31 IS OPEN
LINE 88 IS OPEN
LINE 92 IS OPEN
LINE 97 IS OPEN
LINE 101 IS OPEN
LINE 109 IS OPEN
LINE 116 IS OPEN
LINE 120 IS OPEN
LINE 128 IS OPEN
LINE 134 IS OPEN
LINE 198 IS OPEN

THE FOLLOWING CHANGES IN PIPE DATA ARE SPECIFIED

FOR PIPE NUMBER 600 THE VALUE OF THE FIXED GRADE IS CHANGED TO 26.5

PIPE NO.	NODE NOS.	LENGTH	DIAMETER	ROUGHNESS	MINOR LOSS K	FIXED GRADE
2	1 2	9.7	16.6	5.0	1.82	.00
5	4 5	9.7	16.6	5.0	1.82	.00
198	302 165	205.0	15.3	.2	1035.00	.00

A SUMMARY OF CONDITIONS SPECIFIED FOR THE NEXT SIMULATION FOLLOWS

THE FOLLOWING SPECIFIC DEMAND CHANGES ARE MADE :

JUNCTION NUMBER	DEMAND
13	167.00
66	.00
70	.00
302	4600.00
165	-4600.00

LINE 31 IS CLOSED
LINE 88 IS CLOSED
LINE 92 IS CLOSED
LINE 97 IS CLOSED
LINE 101 IS CLOSED
LINE 109 IS CLOSED
LINE 116 IS CLOSED
LINE 120 IS CLOSED
LINE 128 IS CLOSED
LINE 134 IS CLOSED
LINE 198 IS CLOSED

THE FOLLOWING CHANGES IN PIPE DATA ARE SPECIFIED

FOR PIPE NUMBER 1 THE VALUE OF THE FIXED GRADE IS CHANGED TO 42.0

FOR PIPE NUMBER 4 THE VALUE OF THE FIXED GRADE IS CHANGED TO 42.0

FOR PIPE NUMBER 600 THE VALUE OF THE FIXED GRADE IS CHANGED TO 116.1

PIPE NO.	NODE NOS.	LENGTH	DIAMETER	ROUGHNESS	MINOR LOSS K	FIXED GRADE
2	1 2	9.7	16.6	5.0	2.41	.00
5	4 5	9.7	16.6	5.0	2.41	.00

A SUMMARY OF CONDITIONS SPECIFIED FOR THE NEXT SIMULATION FOLLOWS

THE FOLLOWING SPECIFIC DEMAND CHANGES ARE MADE :

JUNCTION NUMBER	DEMAND
13	110.00
66	.00
70	.00
165	.00
302	.00

LINE 31 IS OPEN
LINE 88 IS OPEN
LINE 92 IS OPEN
LINE 97 IS OPEN
LINE 101 IS OPEN
LINE 109 IS OPEN
LINE 116 IS OPEN
LINE 120 IS OPEN
LINE 128 IS OPEN
LINE 134 IS OPEN

LINE 198 IS OPEN

THE FOLLOWING CHANGES IN PIPE DATA ARE SPECIFIED

FOR PIPE NUMBER 600 THE VALUE OF THE FIXED GRADE IS CHANGED TO 26.5

PIPE NO.	NODE NOS.	LENGTH	DIAMETER	ROUGHNESS	MINOR LOSS K	FIXED GRADE
2	1 2	9.7	16.6	5.0	1.54	.00
5	4 5	9.7	16.6	5.0	1.54	.00
198	302 165	205.0	15.3	.2	822.68	.00

A SUMMARY OF CONDITIONS SPECIFIED FOR THE NEXT SIMULATION FOLLOWS

THE FOLLOWING SPECIFIC DEMAND CHANGES ARE MADE :

JUNCTION NUMBER	DEMAND
13	128.00
66	4000.00
70	-4000.00
302	2800.00
165	-2800.00

LINE 31 IS CLOSED
 LINE 38 IS CLOSED
 LINE 41 IS CLOSED
 LINE 47 IS CLOSED
 LINE 50 IS CLOSED
 LINE 57 IS CLOSED
 LINE 62 IS CLOSED
 LINE 72 IS OPEN
 LINE 73 IS OPEN
 LINE 74 IS OPEN
 LINE 79 IS CLOSED
 LINE 88 IS CLOSED
 LINE 92 IS CLOSED
 LINE 97 IS CLOSED
 LINE 101 IS CLOSED
 LINE 109 IS CLOSED
 LINE 116 IS CLOSED
 LINE 120 IS CLOSED
 LINE 128 IS CLOSED
 LINE 134 IS CLOSED
 LINE 198 IS CLOSED

THE FOLLOWING CHANGES IN PIPE DATA ARE SPECIFIED

FOR PIPE NUMBER 1 THE VALUE OF THE FIXED GRADE IS CHANGED TO 14.0

FOR PIPE NUMBER 4 THE VALUE OF THE FIXED GRADE IS CHANGED TO 14.0

FOR PIPE NUMBER 600 THE VALUE OF THE FIXED GRADE IS CHANGED TO 116.1

PIPE NO.	NODE NOS.	LENGTH	DIAMETER	ROUGHNESS	MINOR LOSS K	FIXED GRADE
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2	1	2	9.7	16.6	5.0	1.89	.00
5	4	5	9.7	16.6	5.0	1.89	.00
24	20	55	24.1	19.3	.2	.68	.00

A SUMMARY OF CONDITIONS SPECIFIED FOR THE NEXT SIMULATION FOLLOWS

THE FOLLOWING SPECIFIC DEMAND CHANGES ARE MADE :

JUNCTION NUMBER	DEMAND
13	110.00
66	.00
70	.00
302	.00
165	.00

LINE 79 IS OPEN

LINE 198 IS OPEN

LINE 128 IS OPEN

LINE 134 IS OPEN

THE FOLLOWING CHANGES IN PIPE DATA ARE SPECIFIED

FOR PIPE NUMBER 600 THE VALUE OF THE FIXED GRADE IS CHANGED TO 26.5

PIPE NO.	NODE NOS.	LENGTH	DIAMETER	ROUGHNESS	MINOR LOSS K	FIXED GRADE
2	1 2	9.7	16.6	5.0	1.55	.00
5	4 5	9.7	16.6	5.0	1.55	.00
79	66 70	29.5	15.3	.2	93.02	.00
198	302 165	205.0	15.3	.2	2207.61	.00

A SUMMARY OF CONDITIONS SPECIFIED FOR THE NEXT SIMULATION FOLLOWS

THE FOLLOWING SPECIFIC DEMAND CHANGES ARE MADE :

JUNCTION NUMBER	DEMAND
66	.00
70	.00
302	.00
165	.00
13	113.00

LINE 31 IS OPEN

LINE 38 IS OPEN

LINE 41 IS OPEN

LINE 47 IS OPEN

LINE 50 IS OPEN

LINE 57 IS OPEN

LINE 62 IS OPEN

LINE 72 IS CLOSED

LINE 73 IS CLOSED

LINE 74 IS CLOSED

LINE 88 IS OPEN

LINE 92 IS OPEN
 LINE 97 IS OPEN
 LINE 101 IS OPEN
 LINE 109 IS OPEN
 LINE 116 IS OPEN
 LINE 120 IS OPEN

THE FOLLOWING CHANGES IN PIPE DATA ARE SPECIFIED

FOR PIPE NUMBER 1 THE VALUE OF THE FIXED GRADE IS CHANGED TO 14.0
 FOR PIPE NUMBER 4 THE VALUE OF THE FIXED GRADE IS CHANGED TO 14.0
 FOR PIPE NUMBER 600 THE VALUE OF THE FIXED GRADE IS CHANGED TO 26.5

PIPE NO.	NODE NOS.	LENGTH	DIAMETER	ROUGHNESS	MINOR LOSS K	FIXED GRADE
2	1 2	9.7	16.6	5.0	7.73	.00
5	4 5	9.7	16.6	5.0	7.73	.00
198	302 165	205.0	15.3	.2	2000.00	.00

A SUMMARY OF CONDITIONS SPECIFIED FOR THE NEXT SIMULATION FOLLOWS

THE FOLLOWING SPECIFIC DEMAND CHANGES ARE MADE :

JUNCTION NUMBER	DEMAND
13	113.00
66	.00
70	.00
302	.00
165	.00

THE FOLLOWING CHANGES IN PIPE DATA ARE SPECIFIED

FOR PIPE NUMBER 1 THE VALUE OF THE FIXED GRADE IS CHANGED TO 11.4
 FOR PIPE NUMBER 4 THE VALUE OF THE FIXED GRADE IS CHANGED TO 11.4

PIPE NO.	NODE NOS.	LENGTH	DIAMETER	ROUGHNESS	MINOR LOSS K	FIXED GRADE
2	1 2	9.7	16.6	5.0	6.48	.00
5	4 5	9.7	16.6	5.0	6.48	.00
198	302 165	205.0	15.3	.2	1900.00	.00