THE REBIRTH OF DISTRICT HEATING IN ROCHESTER, NEW YORK

By

William C. Hanselman & Elliot G. Jennings

RESOURCE DEVELOPMENT ASSOCIATES, INC.

INTRODUCTION

The rebirth of District Heating in Rochester, New York occurred on December 20, 1985 when the Rochester District Heating Cooperative, Inc. formally acquired the downtown Rochester Gas and Electric Steam System. Rebirth, may sound like an exaggerated term given the fact that district heating has been operated without interruption in downtown Rochester since 1889. However, as recently as one year ago it appeared that district heating was dead in Rochester, New York.

This paper presents a summary of the process leading to the steam system's new life. Therefore, the focus is not exclusively technical. On the contrary, the focus of the paper and the success of RDH is placed on the interrelationships of technical, financial, institutional and legal solutions to the many obstacles standing between the demise of the system and continued successful operation. Certainly, credit for the successful acquisition, reconfiguration and revitalization of the Rochester Steam System can and should be spread across the community. Within the context of this paper special mention and recognition should be highlighted for several participants. First, the City of Rochester should be proud that they had the foresight to continue pursuing district heating and, in fact, co-sponsor the very efforts which lead to the system's rebirth. The New York State Energy Research and Development Authority invested predevelopment, preclosing, "at risk" funds to pursue a successful solution. Monroe County came forward as the systems largest user and successfully supported necessary state legislation. Xerox Corporation provided leadership and resources which were necessary conditions for the formation and success of RDH. The Rochester law firm of Boylen, Brown, Code, Fowler, Randall & Wilson deserves special recognition and thanks for their commitment and tireless effort beyond which fees compensate.

THE RG&E STEAM SYSTEMED REVIEWED AND SYSTEM STATUS - FALL, 1984

District heating in Rochester, New York was instituted in the year 1889. At that time Rochester became the third community in the nation to install a central steam system. Like many district heating utilities around the country, steam system development was actually a result of the Rochester Gas & Electric's (RG&E) desire to sell electricity in the downtown area. Exhaust steam from generating equipment was used to heat buildings and provide process heat. The Figure 1 published by the International District Heating Association in 1951 depicts the Rochester steam system during its prosperous years of the late 1940's and 50's.

In 1984, the downtown steam system was composed two steam generating facilities: Station #3 and Station #8; a desuperating pipe connection at Station #6; and the underground distribution piping network. Coal was the primary fuel used until the early 1970's. At that point in time, public concern and regulation with regard to stack particulate emissions necessitated that RG&E consider upgrading the pollution control equipment or fuel conversion at their stations. A decision was made at that time to convert the coal fired boilers at Station #3 to #6 fuel oil and to convert the boiler station to gas rather than install air pollution control equipment and continue coal use.

During the late 1970's and 80's RG&E filed rate increase requests with the New York State Public Service Commission in an effort to secure full compensatory steam rates. This steam rate increase would result in the precipitous escalation of the price of steam and of course trigger substantial community debate. Not withstanding the good efforts by many parties, little or no progress was made toward revitalizing the downtown steam system. In spite of Rochester's long district heating history and the efforts of many parties the consistent opinion seemed to be "its a shame that something can't be done." Finally in July, 1984 the Public Service Commission ordered in Opinion #84-19 anticipated rate increases, and further ordered RG&E to submit a plan to abandon the steam system by October, 1985. Interestingly, this order was issued just several months after the Rochester community began its latest efforts to salvage this system. The Public Service Commission order received wide spread local publicity and RG&E began the process of encouraging customers to consider conversion of their facilities to alternative, distributed systems that is, natural gas. Figure 2 is a RG&E flyer that illustrates this process.

On November 9, 1984, the Rochester District Cooperative, Inc. (RDH) was incorporated under the cooperative laws of the State of New York. The RDH plan for saving district heating in Rochester is summarized by the Figure 3.

In November, 1984 RDH and its potential members had at their disposal Resource Development Associates' Preliminary Technical and Feasibility Reports, the need for steam, substantial fortitude, Mlbs of enthusiasium, and the core of a sound team. RDH concluded that a successful reconfiguration of the downtown steam system could be implemented by scaling back the distribution system and installing a new base load boiler plant. RDH had evaluated six system reconfiguration cases as illustrated in Figure 4. These reconfigurations representated forecasted annual sales between 246,000 and 484,000 Mlbs. The reader should note that the feasibility analysis referenced herein may be reviewed in the report published by the New York State Energy Research and Development Authority, titled, Rochester District Heating System Reconfiguration: Technical and Economic Feasibility prepared by Resource Development Associates. This report can be obtained by contacting Dr. Fred Strnisa at NYSERDA.

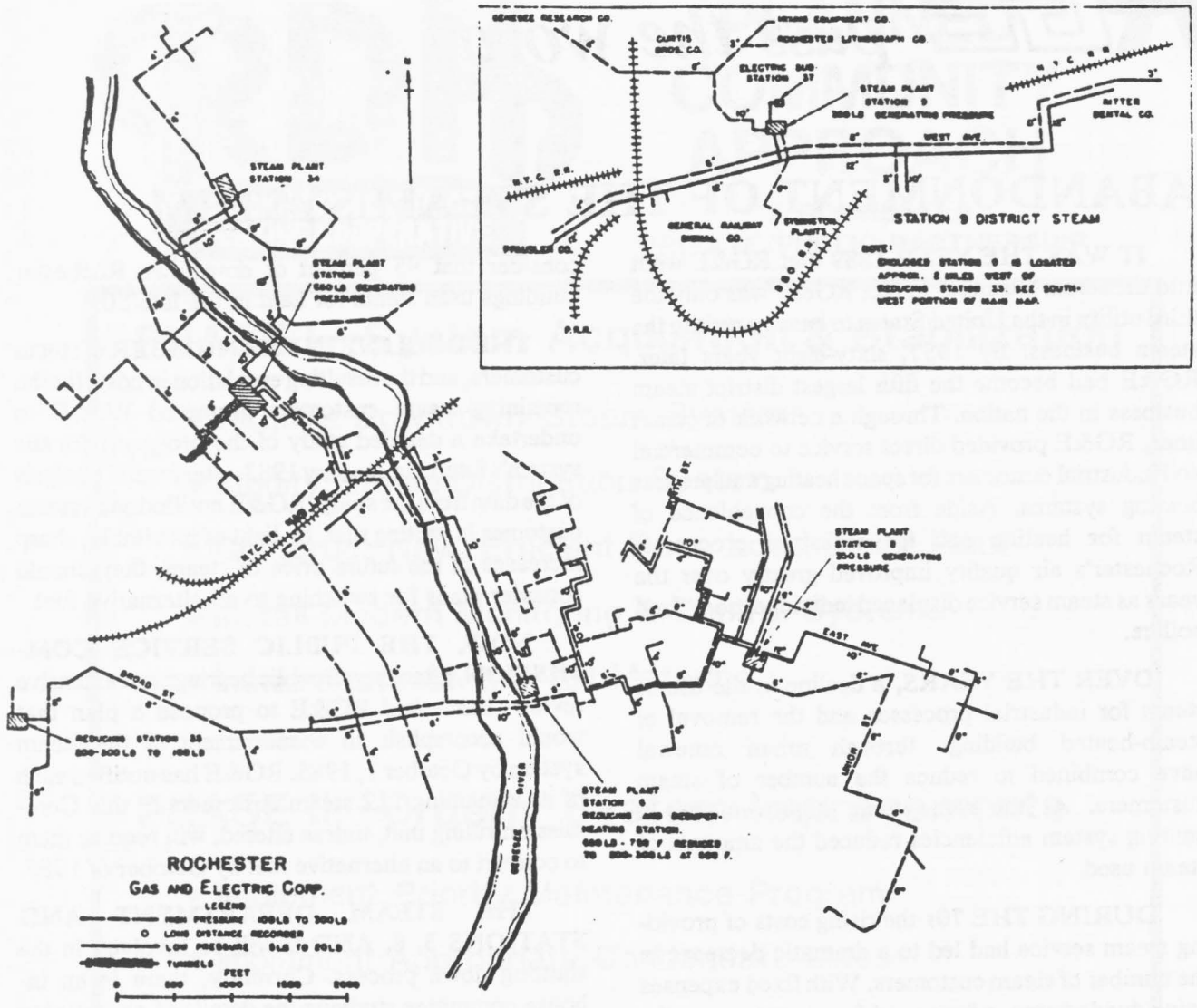


Figure 1 Rochester District Heating System: Late 1940s-Early 1950s. (Courtesy of IDHA)

RG&E *pass the word*

ABANDONMENT OF THE STEAM SYSTEM

IT WAS THE YEAR 1889 that RG&E went into the steam business. In fact RG&E was only the third utility in the United States to have gone into the steam business. By 1957, sixty-eight years later, RG&E had become the fifth largest district steam business in the nation. Through a network of steam lines, RG&E provided direct service to commercial and industrial customers for space heating and process heating systems. Aside from the convenience of steam for heating and for industrial processes, Rochester's air quality improved greatly over the years as steam service displaced individual coal-fired boilers.

OVER THE YEARS, a decline in the use of steam for industrial processes and the removal of steam-heated buildings through urban renewal have combined to reduce the number of steam customers. At the same time, improvements in heating system efficiencies reduced the amounts of steam used.

DURING THE 70s the rising costs of providing steam service had led to a dramatic decrease in the number of steam customers. With fixed expenses being divided among fewer and fewer customers, the costs have become even higher for those remaining. Of the 463 steam customers in 1970, there are only 112 remaining today – a sharp decline when you consider that 95 percent of downtown Rochester buildings used steam for heat in the late 50s.

THE DECLINE IN THE NUMBER of steam customers, and the resulting escalation in costs for the remaining steam customers prompted RG&E to undertake a detailed study of the prospects for the system's future. In January 1983, after careful analysis of the data from the study, RG&E notified each steam customer in writing that, in light of inevitable, sharp increases in the future price of steam, they should consider plans for switching to an alternative fuel.

NOW, THE PUBLIC SERVICE COMMISSION, after its own public hearings and extensive review, has asked RG&E to propose a plan that would accomplish an abandonment of the steam system by October 1, 1985. RG&E has notified each of its remaining 112 steam customers of this Commission ruling that, unless altered, will require them to convert to an alternative fuel by October of 1985.

THE STEAM DEPARTMENT AND STATIONS 3, 8, AND 9 will be involved in the shutting down process. Currently, there is an in-house committee studying the details of abandoning the system. RG&E is offering advice to the remaining steam customers to help them make the best selection for transition from steam to an alternative system.

August 6, 1984

Shedding light on some subjects that need it.

Figure 2

RDH
ROCHESTER DISTRICT HEATING COOPERATIVE

PLANNED COMMUNITY APPROACH

A ROCHESTER
PRIVATE/PUBLIC PARTNERSHIP

PHASE I--System Acquisition & Stabilization

- Acquire Downtown Steam System
- Modify Steam Distribution System
- Construct New, Efficient Base Load Boiler Plant
- Install Modern Monitoring & Control Systems
- Install State-of-the-Art Metering

PHASE II--Orderly System Improvements

- Implement Priority Maintenance Program
- Implement Appropriate Condensate Lines
- Improve Member End-use Efficiency
- Install Appropriate System Growth

Figure 3

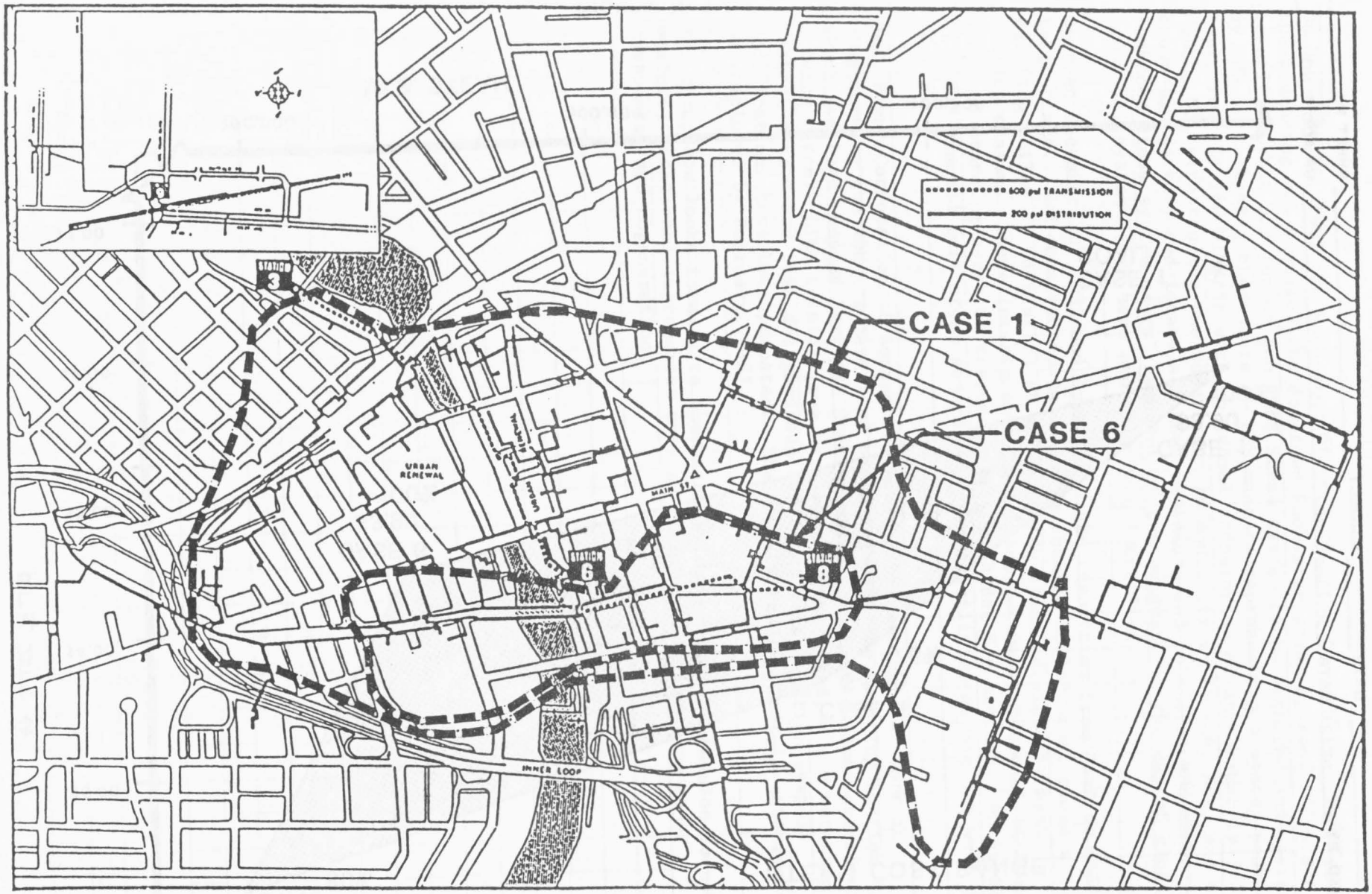
HURDLES TO SUCCESS: SELECTED EXAMPLES AND SOLUTIONS

Standing between the Rochester District Heating Cooperative, Inc. and successful acquisition reconfiguration and revitalization of the downtown steam system stood innumerable hurdles. The first hurdle which was faced continually between November, 1984 and December 20, 1985 was acquiring the appropriate portions of the distribution system to service RDH members without knowing which RG&E customers had committed to RDH membership. Resource Development Associates utilized detailed data base and computer programs to continually iterate the system to meet the project teams technical, financial and legal decision making requirements. To compound the membership problem, in the Spring of 1985 it was concluded that Monroe County, owners of the largest building in the system, could not join RDH without state enabling legislation. In an historically short period of time RDH secured the governor's signature on legislation which permitted Monroe County to join the cooperative. This legislation also exempted RDH from state Public Service Commission regulation for its early years. These two pieces of legislation were only two of many necessary conditions which would have to be fulfilled prior to closing.

RDH faced the prospect of financing the system acquisition, reconfiguration and revitalization with no equity --- 100% debt financing. To accomplish this financing RDH elected to privately place tax-exempt industrial development bonds through the County Of Monroe Industrial Development Authority (COMIDA). RDH selected Manufacturers Hanover Trust (MHT) as their banker. RDH worked with MHT to structure a "low floater bond issue" using variable interest rates secured by a MHT repurchase letter of credit. Ultimate security for the financing rests on the contractural obligation of the RDH members particularly those larger, creditworthy members whose contracts are bankable. This contract known as the Membership and Use Agreement provides for a pricing structure which includes a demand charge and an energy charge. Importantly the Membership and Use Agreement provides that a member terminating the agreement prior to their full 15 year term will pay an "Additional Steam Charge" through which the member fulfills their entire debt obligation.

RDH then secured a fixed price turnkey bid on construction of the new base load boiler plant to be constructed in Station #8, thus minimizing the potential for cost over-runs.

Perhaps the single greatest obstacle faced by RDH was the awkward position in which RG&E found themselves. RG&E had maintained the system in top condition. Certainly the company had a technical and community interest in insuring the continued operation of the steam system. However, as one might expect a combined utility (a supplier of electricity, natural gas and steam) was particularly schizophrenic, for example the gas division would be perfectly satisfied to see all downtown customers on natural gas service as would the steam division prefer to continue steam sales. This internal conflict coupled with nagging uncertainties regarding RDH's ultimate success and RG&E's ultimate responsibility, led the utility to burdensome insurance requirements which had to be in place prior to closing. In fact on the day of closing additional liability insurance policies from RDH were required prior to signature.



ROCHESTER STEAM SYSTEM

Figure 4

Resource Development Associates

BY _____ DATE _____ SUBJECT _____ SHEET NO. _____

CHKD. BY _____ DATE _____ _____ OF ACC'T. NO. _____

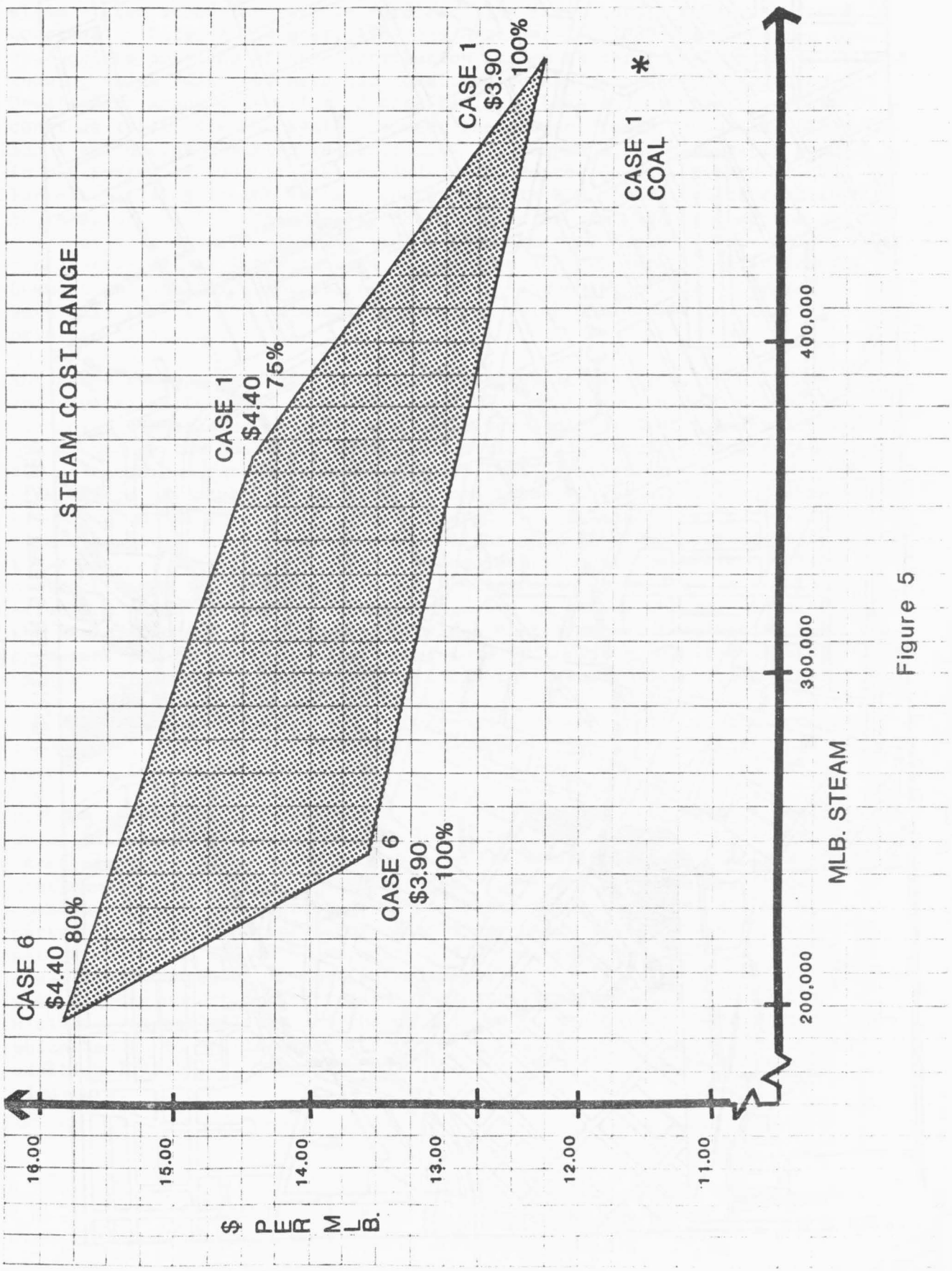


Figure 5

THE CLOSE

On December 20, 1985 the Rochester District Heating Cooperative, Inc. closed the financing and acquired the downtown Rochester steam system. Figure 6 identifies that portion of the RG&E Steam system to be acquired and operated by RDH. At closing there were 46 RDH members representing a system peak of approximately 160 Mlbs/hr with an annual consumption of approximately 370,000 Mlbs. Not withstanding the superhuman 18 month effort by RDH, RDA, and Boylen Brown to identify and locate all RG&E customers and potential RDH members 5 "unknown steam system users" came out of the woodwork on the day of closing. Today all system users have probably been identified.

Between December 20, 1985 and April 29, 1986 transition from RG&E to RDH has taken place. RDH constructed two interim service boilers that along with the existing boiler #3 in Station #8 will provide steam service for next heating season. These interim service boilers became operational in January, 1986 and shared generation responsibility with Bee Bee station. On April 29, 1986 RDH assumed full steam generation responsibilities as Bee Bee went off line.

Bell Power Corporation of Rochester, New York is now hard at work at constructing the RDH new base load boilers inside the existing Station #8 which has been renamed Lartigue Station after the co-op's first president and driving force. Line terminations have been accomplished, a new metering control system has been designed and additional distribution system modifications have been prepared. The new RDH boiler plant is anticipated to be completed by February, 1987.

The co-op now looks forward to operational improvements, expansion to new members, additional improvement such as condensate return from major customers, and cogeneration.

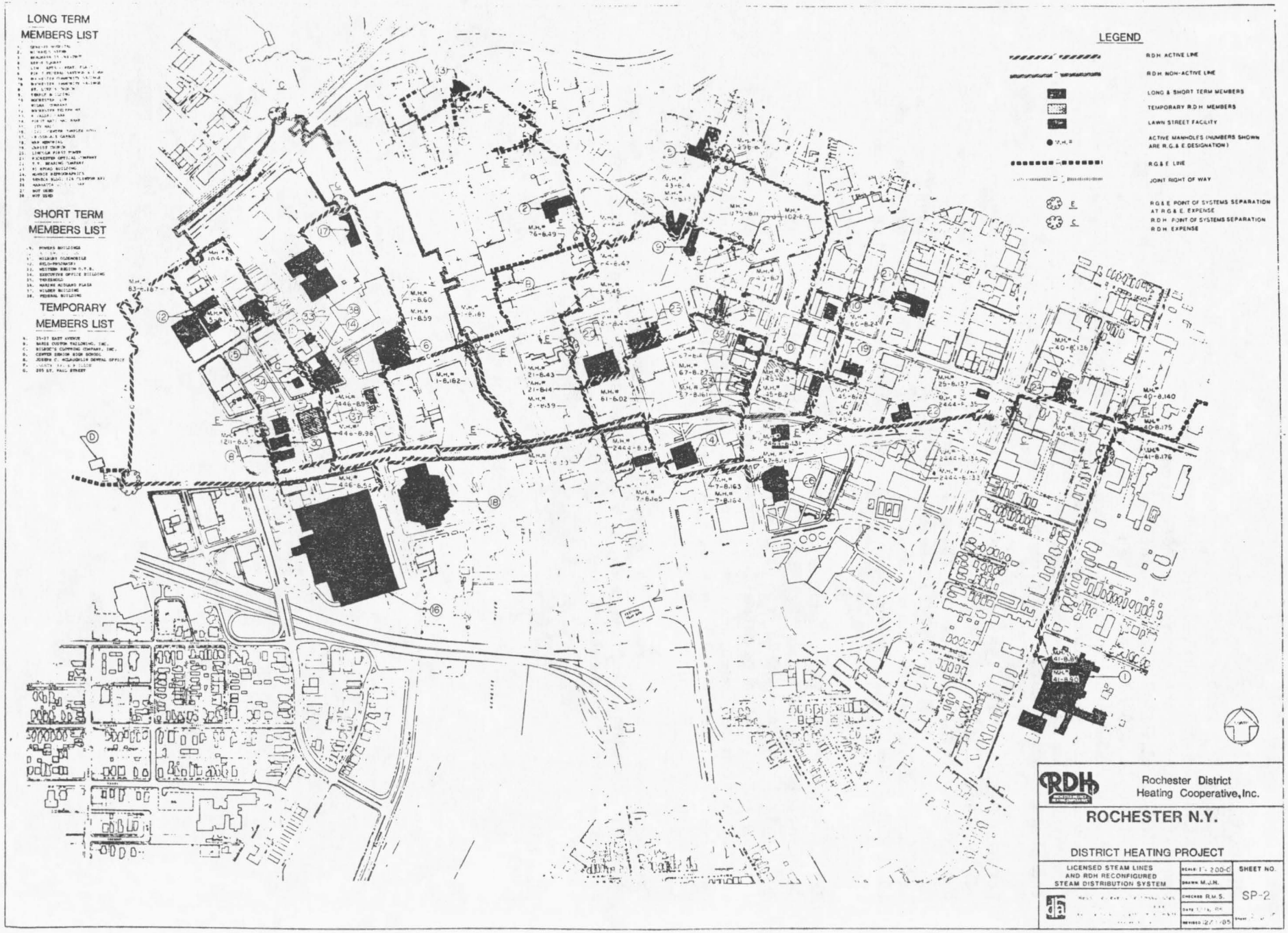

LONG TERM MEMBERS LIST
SHORT TERM MEMBERS LIST
TEMPORARY MEMBERS LIST
LEGEND
R.D.H. ACTIVE LINE
R.D.H. NON-ACTIVE LINE
LONG & SHORT TERM MEMBERS
TEMPORARY R.D.H. MEMBERS
LAWN STREET FACILITY
ACTIVE MANHOLES (NUMBERS SHOWN ARE R.G.& E DESIGNATION)
R.G.& E. LINE
JOINT RIGHT OF WAY
R.G.& E. POINT OF SYSTEMS SEPARATION AT R.G.& E. EXPENSE
R.D.H. POINT OF SYSTEMS SEPARATION R.D.H. EXPENSE
RDH
Rochester District Heating Cooperative, Inc.
ROCHESTER N.Y.
DISTRICT HEATING PROJECT
LICENSED STEAM LINES AND RDH RECONFIGURED STEAM DISTRIBUTION SYSTEM
SHEET NO.
SP-2

Figure 6