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May 7, 2007

British Columbia Utilities Commission
6th Floor, 900 Howe Street
Vancouver, B.C. V6Z 2N3

Attention: Mr. R.J. Pellatt, Commission Secretary

Dear Sir:

Re: Terasen Gas Inc. ("Terasen Gas" or the "Company")
Application for a Certificate of Public Convenience and Necessity ("CPCN")
Distribution Mobile Solution

Pursuant to Section 45 of the *Utilities Commission Act*, Terasen Gas hereby requests approval from the British Columbia Utilities Commission (the "Commission") for a CPCN to implement a technology solution for managing all field work and resources - Distribution Mobile Solution (the "Project" or "Application").

In its Order No. G-51-03 the Commission approved a Settlement Agreement for a Multi-Year Performance-Based Rate Plan for the Company (the "Settlement Agreement") and by Order No. G-33-07 the Commission approved a two-year extension to that Settlement Agreement for 2008 and 2009. Pursuant to the terms of the Settlement Agreement the Company is required to submit CPCN applications for capital expenditures in excess of $5 million.

Terasen Gas submits that the implementation of a new Distribution Mobile Solution is necessary. The new Distribution Mobile Solution is in the public convenience and necessity as there is significant risk that the current system will fail due to aging technology components, as demonstrated by increasing occurrences of system outages which are causing increased operational problems. The current system is made up of several components, some of which have reached the end of their useful life with hardware components in use that are no longer being manufactured and some software components that are subject to significantly reduced vendor support.

A sustained outage would have significant implications on Terasen Gas' ability to dispatch, and thus efficiently perform full, day-to-day customer service work and significantly increase the costs related to the staff necessary to operate and maintain the backup manual system. To date, system outages have been of short duration, however, these outages have been occurring with increasing frequency, indicating that the possibility of a sustained outage increases daily.

Terasen Gas believes the proposed implementation is in the best interests of the Company and of its customers. The total capital cost of the Distribution Mobile Solution is estimated to be $5.98 million, including allowance for funds used during construction. Terasen Gas estimates that the new Distribution Mobile Solution will provide annual Operating and Maintenance ("O&M") expense savings[1] of $576,000. In comparison, if the current system was replace with a manual process using unsophisticated tools such as Excel spreadsheets, Terasen Gas estimates that O&M expenses would increase by roughly $1 million per year, as discussed in Section 2.3 of the Application.

Consistent with past practice for system related investments that are used to serve customers of both Terasen Gas and Terasen Gas (Vancouver Island) Inc. ("TGVI"), the Company requests that 10% proportional allocation of all costs of the asset be transferred to TGVI.

Terasen Gas respectfully requests that it be granted a CPCN allowing the Company to proceed with the proposed implementation. Due to the time constraints associated with Information Technology resource availability, commitments that must be made to vendors to ensure cost certainty, and to ensure that the implementation is completed in a timely manner, Terasen Gas respectfully requests that the Commission review this CPCN on an expeditious basis, such that the Company can commence project work by securing dedicated Vendor resources at the beginning of July 2007 leading to Project completion by approximately August 31, 2008.

Terasen Gas will provide twenty copies of this Application to the Commission and will make this Application and all subsequent exhibits available on the Terasen Gas website under the Regulatory Submissions section for the appropriate service area at the following address link http://www.terasengas.com/_AboutUs/RatesAndRegulatory/BCUCSubmissions/default.htm.

If there are any questions regarding this Application, please contact Mr. Tom Loski, Director, Regulatory Affairs at (604) 592-7464.

Yours very truly,

TERASEN GAS INC.

Original signed by: Tom Loski

For: Scott A. Thomson

Attachment
cc: TGI Multi Year PBR (2004-2007) & 2006 Annual Review & Mid-Term Settlement Review Registered Intervenors

[1] Table 2 , Section 2.4.1 of the Distribution Mobile Solution CPCN Application

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IN THE MATTER OF THE UTILITIES COMMISSION ACT
R.S.B.C. 1996, CHAPTER 473

AND IN THE MATTER OF AN APPLICATION BY
TERASEN GAS INC. FOR THE
DISTRIBUTION MOBILE SOLUTION

To: The Secretary
British Columbia Utilities Commission
Sixth Floor, 900 Howe Street
Vancouver, British Columbia V6Z 2N3

1. THE APPLICATION

Terasen Gas Inc. ("Terasen Gas" or the "Company") hereby applies to the British Columbia Utilities Commission, (the "BCUC" or the "Commission") pursuant to Section 45 of the *Utilities Commission Act*, R.S.B.C. 1996, Chapter 473, (the "Act") for a Certificate of Public Convenience and Necessity ("CPCN") allowing implementation of a technology solution for managing all Company field work and resources. The project for which the CPCN is sought is known as the *Distribution Mobile Solution Project* (the "Project").

1.1 The Applicant

1.1.1 Name, Address and Nature of Business

Terasen Gas is a company incorporated under the laws of the Province of British Columbia and is a wholly-owned subsidiary of Terasen Inc. Terasen Gas maintains an office and place of business at 16705 Fraser Highway, Surrey, British Columbia, V4N 0E8.

The group of Terasen gas distribution companies (including Terasen Gas, Terasen Gas (Vancouver Island) Inc. ("TGVI"), Terasen Gas (Whistler) Inc.) collectively are the largest natural gas distribution utility in British Columbia and one of the largest in Canada, providing sales and transportation services to over 900,000 residential, commercial, and industrial customers in over 125 communities in British Columbia, representing approximately 95% of the natural gas customers in the Province.

1.1.2 Financial Capability of Applicant

Terasen Gas is regulated by the Commission. Terasen Gas is capable of financing the Project either directly, or through its parent, Terasen Inc. Terasen Gas Inc. has credit ratings for senior unsecured debentures from Dominion Bond Rating Service and Moody's Investors Service of A and A3 respectively.

1.1.3 Technical Capability of Applicant

Terasen Gas has successfully implemented other technology projects of similar scope and size to this Project.

1.1.4 Name, Title, and Address of Company Contact

Tom Loski,
Director of Regulatory Affairs
Terasen Gas Inc.
16705 Fraser Highway
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1.1.5 Name, Title, and Address of Legal Counsel

Cal Johnson, Q.C.
Fasken Martineau DuMoulin LLP
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1.2 Executive Summary

Just as banks rely on Automated Teller Machines and airlines on reservation systems, utility companies rely on scheduling and dispatching systems to optimize deployment of their workforce and manage activities. It would not be efficient or cost effective for a utility of Terasen Gas' size and scope to attempt to manage its mobile workforce with manual processes. The number of dispatchers and back office support staff needed to effectively schedule, dispatch and close work manually would be cost prohibitive.

The current system is made up of several components some of which have reached the end of their useful life with hardware components in use that are no longer being manufactured and some software components that are subject to reduced vendor support. A sustained outage would have significant implications on Terasen Gas' ability to dispatch, and thus efficiently perform full, day-to-day customer service work and increase the costs related to the staff necessary to operate and maintain the backup manual system. To date system outages have been of short duration, allowing manual dispatch of customer service work orders, but have occurred with increasing regularity indicating that the possibility of a sustained outage increases daily.

Terasen Gas went through the process of determining its mobile workforce needs and developing a proposed technical solution based on proven technology options. Terasen Gas spent extensive time in defining it's requirements and conducting research on it's own as well as utilizing Gartner Research, an independent and neutral research firm to provide insights into market experiences and an analysis of potential vendors that Terasen Gas was considering[2]. Terasen Gas then determined a short list of vendor options and used the Request-for–Proposal ("RFP") process to determine the preferred vendors and validate the technology being proposed.

Terasen Gas believes that work will be distributed to the highly diversified workforce it employs in a more efficient and effective manner through the implementation of the technology solution it proposes to implement. The proposed solution will allow work assignment based on the diverse skill sets of all available field resources allowing for significant operational and financial benefits. Specifically, the proposed solution will eliminate the need: to raise duplicate work orders for many work types; to maintain resource skills and availabilities in multiple systems; to manually coordinate which resources are supporting which work types; and to manually maintain Excel based "work and time-off schedules".

[2] Gartner Research:

Magic Quadrant for Field Services, 2006 – Published 3 April, 2006 – Author Michael Maoz

Magic Quadrant for Multichannel Access Gateways, 2H06 – Published 6 Oct 2006 – Authors William Clark, Nick Jones, Michael, J. King

The proposed solution will result in reduced system outages that will both improve the efficiency of field resources and reduce the manual workarounds for dispatchers.

Consistent with Order No. G-112-04, where 10% of the Terasen Gas' SAP related costs were allocated to TGVI, the Company proposes that the same 10% proportional allocation of all costs for the Distribution Mobile Solution be used.

The total capital cost is estimated to be $5.98 million, including allowance for funds used during construction ("AFUDC"), while providing annual Operating and Maintenance expense ("O&M") savings of approximately $576,000 detailed in Table 2, Section 2.4.1. Under the terms of the 2004-2007 Multi-Year Performance-Based Rate Plan ("PBR") approved by Commission Order No. G-51-03 ("Settlement Agreement") and extended to December 31, 2009 on March 22, 2007 by Commission Order No. G-33-07), a portion of the O&M benefits will directly benefit customers ($129,600 in 2008 and $259,200 in 2009)

The quantifiable benefits of this Project, from which the estimated $576,000 in savings are expected, include:

- Improved Optimization of Field Resources;
- Elimination of Complex, Duplicated, and Error Prone Resource Management Processes;
- Field Resources Using a Single System;
- Elimination of Manual Data Validation and Entry;
- Elimination of Time and Costing Data Reconciliation; and
- Improved Communication between Dispatch and the Field.

In addition, unquantifiable benefits of the Project include:

- Automation of Preventive Maintenance Processes;
- Improved Communication between Dispatch and the Field;
- Simplification of Reporting;
- Stable and Supportable System;
- Enhanced safety for field staff working alone; and
- Integrity Management Plan Audit Evidence.

Further detail on the project benefits can be found in Section 2.4

Underlying the need for the implementation of the Distribution Mobile Project are new requirements from Annex N of the Canadian Standards Association Z662, which requires Terasen Gas to implement a pipeline integrity management program. In addition, Commission Order No. G-34-07 directed TGVI to provide a comparison of planned and actual activities

relating to the Integrity Management Plan. The proposed solution will be instrumental in ensuring and demonstrating that required work is scheduled and completed as outlined in the plan.

Terasen Gas is requesting that it be granted a CPCN allowing it to proceed with the proposed Dispatch Mobile Solution implementation, believing it to be in the best interest of customers and the Company. Project completion is targeted for August 31, 2008, assuming a start date the first week of July 2007.

1.3 Regulatory Review of CPCN Application

Terasen Gas requests that the Commission complete its process to review this Application and reach a decision by the end of June, 2007 so that cost and labour guarantees provided by the proposed vendor can be achieved and the proposed schedule outlined herein can be met. If work does not commence the first week of July 2007, the Company is of the view that costs would likely rise and the schedule could be severely compromised. Due to the fact that the vendors are highly sought after, a delayed start would likely result in the necessity for Terasen Gas to go back and renegotiate a new starting date with the vendors as it will not be possible for them to hold a project team for an extended period of time. With the current fragile state of the system as described in Section 1.2, the Company believes that such a delay would result in too great of an operational risk and higher O&M expenses.

Consistent with the Settlement Agreement approved by Order No. G-51-03 and extended by Order No. G-33-07, a CPCN is necessary for this Project as it is in excess of $5 million. The Company is of the view that a written review and approval process is appropriate for this Application. The Company has informed customers and stakeholders during the course of its 2005 and 2006 Annual Review processes and its 2006 Resource Plan of its intention to pursue this Project.

1.4 Capital Expenditures

Terasen Gas' total capital cost of implementing the Distribution Mobile Solution is estimated at $5.98 million, which is described in greater detail in Section 2.4.2 and is summarized below in Table 1.

Table 1

	2007	2008	Totals
	Total	**Total**	**Total**
Internal Labour	**$337,329**	**$379,848**	**$717,176**
Consulting	**$1,219,679**	**$1,718,476**	**$2,938,155**
Hardware	**$150,000**	**$162,000**	**$312,000**
Software	**$568,436**	**$23,112**	**$591,548**
Expenses	**$144,136**	**$291,650**	**$435,786**
Contingency	**$78,974**	**$315,896**	**$394,869**
Total	**$2,498,554**	**$2,890,981**	**$5,389,535**
2006 Spend			$256,000
AFUDC			$338,732
Total			**$5,984,267**

1.5 Conclusion

Terasen Gas submits that this Application is in the public interest. If approved, it will bring benefits to the Company and customers both initially and over the long term. The benefits include both quantifiable benefits and unquantifiable benefits:

Quantifiable annual O&M savings totalling $576,000 of this Project include:

- Improved Optimization of Field Resources;
- Elimination of Complex, Duplicated, and Error Prone Resource Management Processes;
- Field Resources Using a Single System;
- Elimination of Manual Data Validation and Entry;
- Elimination of Time and Costing Data Reconciliation; and
- Improved Communication between Dispatch and the Field.

In addition, unquantifiable benefits of the Project include:

- Automation of Preventive Maintenance Processes;
- Improved Communication between Dispatch and the Field;
- Simplification of Reporting;
- Stable and Supportable System;
- Enhanced safety for field staff working alone; and
- Integrity Management Plan Audit Evidence.

Alternatives to installing a new system are much less favourable in that both doing nothing and moving to a manual system would increase O&M costs by approximately $1 million and not achieve the benefits listed above.

2. PROJECT JUSTIFICATION

2.1 History

In 1999 Terasen Gas developed a resource management strategy for scheduling and allocating work to its field or "mobile" workforce. The Terasen Gas mobile workforce performs three different types of field work: Customer Service ("CS"), Construction, and Preventive Maintenance ("PM"). The management of the field work entails three separate steps: 1) scheduling work by matching skills required with specific individuals or crews and their availability; 2) dispatching individuals and crews to locations, and 3) providing work instructions to field staff. Terasen Gas envisioned that the management of its mobile workforce in the performance of the three types of field work would be coordinated through a single, centralized scheduling and dispatching centre. Work schedule would then be optimized for the available resources based on skill-set, proficiency, and proximity. While the fundamentals of the strategy hold true today, the Company's strategy has evolved and the current strategy is described in more detail in Section 2.2.6.

The original resource management strategy was implemented in phases over a period of several years, owing in large part to technology limitations as the applications available in 1999 were unable to meet the full requirements needed to satisfy the strategy. Applications and processes for each field work type and process were developed and implemented on a component by component basis. The first system component to be implemented was a mobile data dispatch application to manage work assignments for CS work. This was implemented in March 2001, and allowed for the successful centralization of resource management for CS work at the Company's Surrey Operations Centre in 2002.

PM and Construction work were not part of the scope of the implementation of the mobile data dispatch application due to technology limitations, but it was the intent that the mobile data dispatch application would allow for the addition of those work types in the future. However, implementation of subsequent components of that application to support the effective management of the PM and Construction work of Terasen Gas was never undertaken due to the lack of development of the mobile data dispatch application by its Vendor. As a result, in 2002, PM work activities were migrated to SAP R/3. The processes implemented for dispatching this work to the mobile workforce, and receipt of the work in the field were largely manual in nature and continue to be used today. In 2003, Construction work activities were

moved to SAP R/3, and again, due to a lack of product development in the existing mobile solution that provided the functionality required by Terasen Gas, manual "paper-based" dispatching and receiving processes were implemented and continue to be in use today.

Terasen Gas has been able to move ahead with other technology implementations, and in 2005 enhancements to the Construction resource management process were implemented to improve scheduling using Click Software's ClickSchedule application and to pilot wireless field communication software using SAP's Mobile Asset Management application. ClickSchedule also provides additional capabilities, such as: appointment booking, management of complex work with dependencies, schedule optimization, street-level routing, and visibility of future work.

2.2 Current Situation

The existing technology used for dispatching the CS work has reached the end of its useful life and components within the system are experiencing increasing occurrences of system outages. To date system outages have been of short duration, allowing manual dispatch of customer service work orders to be sufficient. A sustained outage would have significant implications on Terasen Gas' ability to dispatch, and thus efficiently perform, full day-to-day customer service work, as well as hinder efforts to complete Construction and PM work, and may result in compromising the Company's ability to meet certain of its Service Quality Indicators ("SQI's") as set out under the terms of the current Settlement Agreement. In addition, the current system is made up of several components some of which have reached the end of their useful life. Some hardware components are no longer being manufactured and some software components are subject to reduced vendor support. The net result of this is an increased risk of system failure. The original vendor of the mobile dispatch application "MobileUp" component of the system sought Chapter 11 bankruptcy protection since the original implementation in 1999, and while the original vendor was able to come out of Chapter 11 protection and was subsequently purchased by another software company, ViryaNet, its mobile dispatch application no longer supports Terasen Gas' current needs.

Terasen Gas re-examined its mobile data dispatch technology options in order to determine if it could achieve the benefits as envisioned in the overall mobile workforce resource management strategy and to address the increasing risk of system failure. Terasen Gas determined that a new mobile data dispatch application would ultimately be required. A plan for the replacement of the current system has been in development since 2005, and as a result, the decision was

made to cease further investment in the current technology until such time as the Company determined the appropriate course of action.

2.2.1 Description of Field Work Processes

As described in Section 2.1, Terasen Gas field work (CS, PM and Construction) is currently managed by three distinct processes for managing mobile workforce resources, dispatching work, and receiving work in the field, each of which is supported by its own components within the overall system.

2.2.1.1 Customer Service Work

Customer Service work is initiated in the Customer Information System ("CIS") - the "Energy" system, either through a customer call to the call centre or through the recognition of a metering irregularity. Approximately 115,000 work orders per year are sent to the mobile data dispatch application (MobileUP) where they are assigned to qualified and available technicians within the mobile workforce. Jobs are wirelessly communicated to the field technicians, who update the status of the jobs as they work through them. Upon job completion, the necessary completion information is filled out by the technician in the field application and is then electronically sent back to Energy for job closing.

2.2.1.2 Maintenance Work

Maintenance work is initiated directly in SAP's Plant Maintenance module. PM work orders are created automatically by SAP based on maintenance plans, and corrective work orders are created manually by maintenance analysts based on condition reports provided by the field technicians. Approximately 55,000 maintenance work orders per year are dispatched by exporting lists of work orders into Excel spreadsheets, manually assigning the work to technicians, and emailing the lists to the technicians. Completion information is recorded by the field technicians in a series of Microsoft Word and Excel forms, which are returned to the office by email. Office staff then convert these electronic forms to input files and use a custom program to load them into SAP's Plant Maintenance module.

2.2.1.3 Construction Work

Construction work is initiated in the Café application, usually as the result of a customer request for a new service attachment to the gas distribution network. Job planning and pricing information is gathered from the customer, and an electronic request is sent to ClickSchedule to check for crew availability. Once the customer agrees to the pricing and scheduling

appointment, the quotation is accepted which triggers its automatic submission to SAP. Each field activity within a job creates an SAP work order, which in turn creates an equivalent ClickSchedule task. ClickSchedule then works to optimize the task timing and assignment to produce an effective work schedule, accounting for scheduling rules, geography, dependent jobs, and customer appointments. When the work order is ready to go to the field, a status change in ClickSchedule triggers SAP to download the work orders to SAP's Mobile Asset Management. As the field crews process the work, status updates are sent to SAP which in turn updates ClickSchedule as the crews go "en route", arrive, and complete the work. Since the construction process still requires paper drawings, field sketches, and permit documents, it is not yet a paperless process. Job completion information is recorded via paper documents which are returned to the office for clerical processing in SAP and Automated Mapping and Facilities Management ("AMFM"). Approximately 30,000 construction work orders are completed annually.

2.2.1.4 Work Process Summary

There are 230 discreet work order types associated with the 3 types of field work described above, with the annual number of work orders approximating 200,000 (CS at 115,000, PM at 55,000 and Construction at 30,000). Of the 230 discreet work types, there are a number that cross all three components, such as emergency response and complex multi-family construction. These specific work types require complex manual coordination, which potentially results in duplicate processing and errors. The current solution, with its component pieces also results in multiple data repositories, thereby limiting effectiveness of the solution while creating inefficiencies. Lack of a single repository of resource data means that schedules are maintained in a set of Excel spreadsheets that are manually kept in sync with the other dispatching applications.

Historically, as field resources were specialized and largely aligned with one of the three field work types, Terasen Gas was able to manage, dispatch and receive work for these mobile workforce resources using three separate and distinct sets of processes and technologies. However, as service units within the Company move to a more generic, less specialized workforce model where workers frequently move between the field work types, the use of three different methods of managing, dispatching and receiving work becomes more complex, error-prone and resource intensive.

2.2.2 Mobile Workforce Resources

The Terasen Gas mobile workforce is comprised of approximately 440 individuals, designated by 15 job descriptions. Mobile workforce employees may work individually or in crews of 2 or 3 employees. Currently, approximately 50% of the workforce has the skill set to perform only construction related work, 20% only customer service related work with 30% having the skills to perform varying degrees of all three field work types. The current technology solution requires that work from each of the three work types must be dispatched to and received by these multi-skilled workers from the specific system components for each work type. As a result, multi-skilled workers are required to access three different system components to receive and complete their work.

Another factor considered in the re-examination of the mobile data dispatch technology options was workplace demographics. An analysis of Terasen Gas' mobile workforce demographic has determined that, as with Canadian Gas Association industry peers, Terasen Gas will be experiencing a "baby boomer" resource challenge of significance within the next 3-5 years. As Terasen Gas replaces these workers over the next several years, the new recruits will not immediately be as proficient as those they have replaced and it is expected to take up to 2 or 3 years in some cases to be fully proficient, which will need to be considered in the scheduling process. In response to the changes in the workforce demographics occurring and expected in the near future, the Company is of the view that the scheduling of employees will become increasingly difficult and as a consequence it will need to become more efficient.

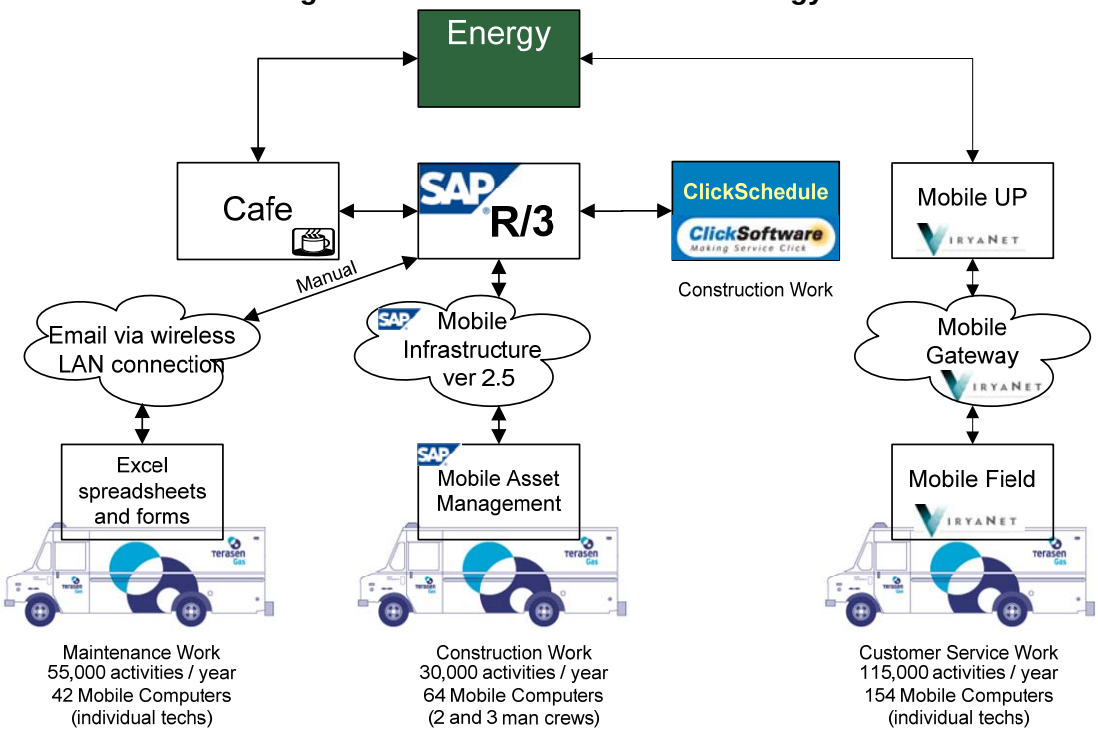
The Company is adapting its recruiting practices in light of changing workplace demographics which will result in high I.B.E.W. workforce attrition in the next 3-5 years by replacing specialist positions with multi-skilled employees. Recent negotiated changes to the I.B.E.W. collective agreement now allow for flexible options to train and assign field resources as work-type and workload requirements demand. This facilitates further optimization of this workforce and would allow the Company to operate at a lower overall cost. The current procedures and applications used for scheduling and dispatching however do not facilitate the achievement of this goal.

2.2.3 Current State Technology

Figure 2.2.3 below summarizes the current technologies, as described in Section 2.2.1, used to manage the scheduling and dispatch of resources and work for Terasen Gas' mobile workforce. As can be seen in the figure below, the system that is used to interface with the mobile workforce is different for each of the three types of field work. The technicians and crews utilize

either laptops or other mobile computers in their vehicles that are dedicated to the specific application used for scheduling. Consequently, those employees who have the skill sets and capabilities to perform work across multiple field work types require access to the different systems, but unfortunately only one system can be accessed at a time. Not only does this require an employee to learn the requirements of more than one system, it also reduces efficiencies as the employee either needs to be contacted by cell phone to inform the employee to look at the different system or the employee must regularly scan multiple systems.

Figure 2.2.3 Current State Technology



While Multi-skilled Techs can perform some components of all three work types, their movement between the streams requires use of multiple technologies and must be manually coordinated.

2.2.4 Mobile Workforce Scheduling and Dispatching Challenges

The scheduling of crews and technicians is a complex challenge. As stated earlier, the task involves matching up the approximate 440 employees, working as individual technicians or in crews, plus contractor crews, with specific jobs, of which there are 230 different types and roughly 200,000 different work orders each year.

As stated in Section 2.2, there are approximately 240 employees who work in crews, in addition to a contingent of contractor crews. The individual employees assigned to these 2 or 3 person

crews each have unique skill sets and capabilities, which need to be considered when assigning work. Consequently the task of assessing capabilities of the crews is more complicated than that required for the technicians who work on an individual basis. To further add to the complexity for the scheduling of work to crews and individual technicians, there are an increasing number of employees who are now multi-skilled and could meet the qualifications of jobs within any of the three work types. It is essential that these skill sets are adequately considered during the scheduling exercise to ensure optimal efficiency.

As part of the scheduling exercise the availability of employees must also be considered. Parameters that impact this include scheduled time-off such as annual vacation, unscheduled time-off such as sick-time and other requirements such as training and safety meetings. Availability of employees is also impacted by the amount of time it will take to complete a given task. If completion of an assignment takes longer than planned, this will impact the timing of subsequent jobs which could result in the need for rescheduling, which could affect multiple employees across multiple days. Additionally, travel time between jobs must also betaken into consideration during the scheduling process.

The nature of each job, of which there are 230 different types as previously stated, also have unique requirements related to materials, tools, and equipment, in addition to the employee expertise required. These requirements will vary from job to job, but need to be considered during the scheduling process.

The scheduling process must also take into account commitments that the Company has made to customers. For various job types, the Company commits to commencement or completion of the work on certain dates or at certain windows of time within a day. The Company strives to ensure that it can fulfill the commitments that it makes and is reticent to alter its plans with customers if it can be avoided, thereby placing greater stress on the scheduling process.

Emergency situations place additional stress on the scheduling and dispatch process as re-prioritization of work must be done to address the situation. Emergency situations will have impacts on scheduling and dispatching, which, depending on the nature of the situation, could last for hour or days. The shortcomings of the current system respecting the response to emergency situations, is described in Section 2.2.4.2 below.

As can be seen from the foregoing discussion, there are many parameters that need to be considered simultaneously in the scheduling and dispatching processes. A large number of these parameters are in a constant state of change, making the scheduling process a very dynamic and extremely complicated task. This complexity is heightened in an environment where there are roughly 200,000 jobs performed each year and where the skill sets and capabilities of the resources are going through a period of major change. A complicated, dynamic task such as this requires appropriate tools to ensure effective and efficient decision-making. The existing system lacks the sophistication necessary to effectively and efficiently consider the various parameters generally described above, and listed below:

EXAMPLES OF CHARACTERISTICS (i.e. decision-making parameters)

Resources (consider each for crews and crew members individually)

- Working / available hours;
- Periods of non-availability (due to training, meetings, sickness);
- Skills capabilities;
- Location (point of assembly and work location);
- Crew role (e.g. crew leader is critical, apprentice is not); and
- Materials, tools and equipment.

Work

- Pre-requisites to start work (e.g. pre-construction activities, customer obligations, pre-fabrication);
- Commitment dates;
- Appointments;
- Skill requirements;
- Work duration;
- Dependencies between operations within an order (time and resource);
- Mixing workforces between work types;
- Prioritization according to all work types and business lines; and
- Preference for work including geographic location and internal versus external crew.

2.2.4.1 Regulatory Requirements

Recently added Annex N of Canadian Standards Association Standard Z662, requires that Terasen Gas implement a pipeline integrity management program. In its Order No. G-34-07 the Commission directed TGVI to provide a comparison of planned and actual activities relating to the Integrity Management Plan. The current processes and activities used for dispatching and

scheduling, as described in Section 2.2.1, do not efficiently or effectively facilitate the complex records management processes related to providing evidence to regulating bodies that integrity work was scheduled and completed as outlined in the program. Currently, work completion records are manually updated using e-mailed forms to detail the work that has been completed. These details are then manually entered into another application by a second employee. The current manual updates of work scheduled and completed may not provide sufficient audit evidence that would satisfy the requirements of the integrity management program.

2.2.4.2 Emergency Response Dispatch

In an emergency it is not possible to quickly ascertain the specific location or availability of all employees throughout the system who may be able to respond to the situation, therefore, employees are dispatched based on general location and the type of work they are associated with. This may mean that a qualified employee, who is closer to the emergency but not currently associated with the work required for the emergency, is potentially ignored by the current system and an employee who has a longer response time is dispatched.

2.2.5 Summary of Current Situation

The current scheduling and dispatching solution relies on a number of different computer applications, of which one, MobileUp, has reached the end of its useful life, is becoming less stable and is not supported adequately by the vendor. There is a significant reliance on manual processes and interfaces, which result in a solution that is not optimal. Both the current applications used and the manual processes used today will be increasingly taxed by the changes expected to the mobile workforce as the Company continues its move to a multi-skilled workforce capable of performing all three work types. The fragile nature of the current system, combined with its lack of sophistication necessary to facilitate more effective and efficient scheduling and dispatching, highlights the less than optimal nature of the current solution. Taking these circumstances into account, and also considering work force demographics, regulatory requirements, and the need to ensure that emergency response times are met, the Company determined that it was prudent and in the best interests of customers to re-assess its scheduling and dispatching strategy for its mobile workforce, and to assess the options available to the Company.

2.2.6 Field Mobile Workforce Strategy

In 1999 Terasen Gas developed a resource management strategy which called for the coordinated management of its mobile workforce in the performance of the three types of field

work through a single, centralized scheduling and dispatching centre. The strategy was for this centralized centre to rely on an integrated set of processes and applications utilizing a sophisticated planning tool whereby the work schedule could be optimized for the available resources based on skill-set, proficiency, and proximity, leading to greater effectiveness and efficiencies. As discussed above, it was not possible to fully implement this strategy.

In 2006, the Company undertook a review of the 1999 resource management strategy. Advances in technology and the changing workforce demographics of multi-skilled employees were examined as part of that review in an effort to assess the ongoing validity of the strategy after seven years. As a result of undertaking that review, the formation of a revised resource management strategy, namely, the "Field Mobile Workforce Strategy" was developed. During the review process the core aspects of the 1999 resource management strategy were affirmed, while at the same time, Terasen Gas had the opportunity to incorporate advances in proven technologies and the changing demographics of Terasen Gas employees. The Field Mobile Workforce Strategy forms the Company's vision for how it should most effectively manage its mobile workforce with an increasing number of multi-skilled workers.

To achieve the new strategy, Terasen Gas developed a comprehensive set of business requirements which it has used to evaluate and select the appropriate technology solutions. These are:

- Core work, primarily performed by Terasen Gas resources, includes emergencies, distribution operations, maintenance and customer service;
- Construction work is considered non-core and primarily will be performed by Contract crews, under Terasen Gas oversight;
- There are no current plans to discontinue any types of work currently performed by the Company;
- The field staffing approach will continue to be based on staffing levels necessary to meet internal requirements with the goal to maximize work performed by the base set of internal resources to minimize costs and maintain core skill sets. Additional workload will be assigned to contract resources to manage demand fluctuations and minimize cost. This affords a flexible rather than static model for which workforce can perform various types of work;
- Terasen Gas will continue to contract routine installation work, working with small contingent of contractors (4 to 5 year contract durations) using Unit price based contracts. Terasen

Gas will track and monitor the status of work assigned to contractors but will not seek to optimize or directly manage contractor crews; and

- Work of all types will continue to be managed by Terasen Gas employees in order to meet the primary objectives of safety, reliability, and cost effectiveness.

2.2.7 Conclusion of Current Situation

Terasen Gas is of the view that its Field Mobile Workforce Strategy, as discussed in Section 2.2.6, is the appropriate direction for the Company in the evolution of its scheduling and dispatching solution. By performing the scheduling and dispatching for the entire mobile workforce for all types of field work through a single group, utilizing an integrated set of processes and systems, Terasen Gas believes it will allow for the most effective and efficient means of performing those tasks. The Company believes that the current scheduling and dispatching solution is at significant risk of failing which would result in a significant permanent increase in O&M expenses if not addressed appropriately, and could lead to the Company not being able to meet certain of its SQI targets.

One of the applications utilized, MobileUp, is at the end of its useful life and is no longer supported adequately by the vendor. This application has experienced recent outages, and it is likely that these outages will continue to occur, likely with increasing frequency. The complexity of the scheduling and dispatching processes and the shortcomings of the current solution were described in Sections 2.2 through 2.4. The current solution with its lack of sophistication is unable to provide the Company with the most efficient use of resources, and with the changes the Company is pursuing in responding to its demographic challenges by moving to a field workforce with multiple skill sets, the current solution will be further taxed. The current solution creates duplicate work orders for many work types, requires maintenance of resource skills and availabilities in multiple systems, manual coordination to determine which resources are supporting which work types, and requires manual maintenance of Excel based tools.

Terasen Gas is of the view that its current solution is not sustainable and that it is prudent and in the best interests of customers that it pursue an assessment of its options to facilitate the implementation of its Field Mobile Workforce Strategy.

2.3 Analysis of Project Options

In reviewing the options available to the Company three options were considered:

1. A completely manual process;

2. Continued use of the current solution; and
3. A replacement of the current solution.

It would not be efficient or cost effective for a utility of Terasen Gas' size and scope to attempt to manage its mobile workforce with manual processes. The number of dispatchers and back office support staff needed to effectively schedule, dispatch and close work manually would be cost prohibitive. Field efficiencies gained through previous automation of the original Customer Service solution (MobileUp) would be compromised, resulting in an increase in the number of technicians required. Manual operations would be complex, error-prone and increase the time required to process work. Although a detailed analysis of the total impacts of reverting to manual processes was not undertaken, the benefits the Company has already achieved through automation would not be sustainable with the use of manual processes. It is estimated that at a minimum 10 additional office staff and 6 additional field staff would be required at a cost of $1.1 million per year, in current dollars. Increases in non labour operating costs such as additional use of cellular, radio, fax and paper would total approximately $200,000 per year. This increase would be somewhat offset by a reduction in technology licensing and support costs of $270,000 for a total net increase of approximately $1.03 million per year. In addition, future operating expense savings would not be attainable. The Company is also concerned that this approach could compromise its ability to meet its SQI targets.

In considering the option of simply doing nothing, and using the current system, it was determined that the current mobile data dispatch application is failing and poses a significant and increasing risk to the Company's ongoing operations. Major components of the current system are approximately 7 years old and are becoming increasingly unstable. This instability is causing periods of increasing downtime critically supporting the urgent need for replacement at this time. The results of this system interruption and the consequences of choosing this option are in effect the same as those found under a completely manual process as the possibility of extended periods of system outages increases.

There are gaps within the current overall system that limit Terasen Gas' ability to operate effectively and to move towards vision identified in its Field Mobile Workforce Strategy. The vendor for the current CS work dispatch component has no plans to update its mobile application in a direction that would meet Terasen Gas' needs.

Options 1 and 2 do not provide Terasen Gas with the tools or opportunity to fully implement its 2006 Field Mobile Workforce Strategy as identified in Section 2.2.6. Both options 1 and 2 do not address the shortcomings of the current solution, as summarized in Section 2.2.7, in particular, the shortcomings inherent with the manual processes identified and multiple applications. The Company, therefore, is of the view that it was prudent to look for a new solution that would address those identified shortcomings and provide the necessary tools and applications to enable the Company to implement its Field Mobile Workforce Strategy.

2.3.1 Solution Selection Approach

The Field Mobile Workforce Strategy describes the end-state vision for the management of the Company's field workforce. Numerous workshops were completed to develop and validate this strategy and to ensure the full range of business requirements were captured. These requirements were used to develop conceptual designs for the future state processes and technical architecture, which were vetted with key business process owners and subject matter experts throughout the Company.

Research supported Terasen Gas' belief that while the Field Service software market in the past was dominated by single-purpose mobile data dispatching ("MDD") applications, their lack of compatibility with large Enterprise Resource Planning systems had caused the market to shift to a more component based model where best-of-breed applications work in concert with existing work order systems like SAP. In the past, mobile communication provided by these MDD systems was proprietary and provided access to only the vendor's own back-end system. This model is giving way to a more general set of mobile applications (generically referred to as Multichannel Access Gateways or MAGS) that provide broad based mobile access to back-end corporate applications and deliver robust tools for managing mobile workers. This is the same architecture proposed by the Field Mobile Workforce Strategy as it provides the best combination of functionality for meeting the business requirements, but also best supports potentially adding other applications and capabilities in the future.

Terasen Gas has also reviewed the solution previously implemented for Construction work as it relates to the Field Mobile Workforce Strategy, to determine if it would support the full set of the Company's requirements. Support issues with the existing Mobile SAP pilot implementation led to questions as to SAP's ability to support their product. SAP also announced plans to fully re-architect its mobile solution set, leading to further concerns over how mature a product Terasen Gas would be left with. Analysis also confirmed that a number of other SAP customers were

suffering identical issues with SAP's mobile product as was Terasen Gas. As a result, an exercise was initiated to select a solution that best suited the Company. Based on its research, Terasen Gas determined a short list of vendors that could support its requirements. These vendors were: Antenna Software (http://www.antennasoftware.com/) Syclo (http://www.syclo.com/) and Sybase (http://www.sybase.com/).

The three vendors, Antenna Software, Syclo, and Sybase, were issued an RFP in order to examine their ability to support Terasen Gas' requirements, their implementation approach and estimated effort, their application support model and capability, their licensing structure and cost, and implementation experience. The three vendors responded with written proposals, parts of which are confidential. Through this exercise, it was determined that Antenna Software primarily supported Sales Force Automation (SFA) and Customer Relationship Management (CRM) solutions and did not support Terasen Gas' requirements for management of maintenance and asset integrity work as well as Syclo and Sybase. It was decided not to continue further with Antenna Software through the selection process.

A Request for Quotation ("RFQ") was then issued to Sybase and Syclo which included a 78 page listing of Terasen Gas' functional requirements and requiring a detailed response of their applications' ability to support the requirements and detailed implementation plans and costs. The vendors responded with both written submissions and oral presentations parts of which are also confidential. Reference conference calls were also held with two reference implementations where the solutions had been implemented to support similar requirements to Terasen Gas.

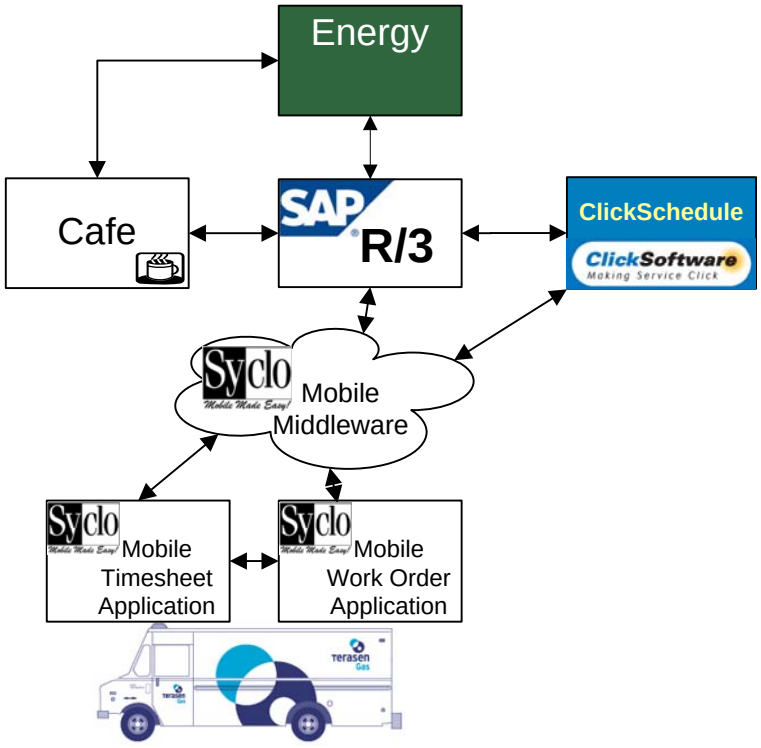
As a result of this exercise, Syclo was selected as the most appropriate vendor offering a solution for mobile field communication (SMART) to best fit the needs of Terasen Gas. Syclo's solution meets 100% of the Core requirements with minor customization. Sybase substantially meets (94%) of the core requirements with minor customization.

Sybase' approach is to work with clients to implement a solution specific to each company's requirements while Syclo's model starts with a more generic, predefined base for all companies, allowing for the implementation of functionality that all companies can benefit from. As a result, Sybase would have been considerably more complex and costly to implement and support than the Syclo solution. Sybase's quoted implementation hours were 2 ½ times more than Syclo's bid, reflecting their customer specific approach to product development. Syclo also aligns better

with Terasen Gas' strategy of implementing package applications rather than maintaining the large in-house technical staff required to support custom developed applications. The use of Syclo will allow Terasen Gas to gain advantage from the best-practices built into the product as it evolves to meet other utility companies' requirements. Implementation of Sybase would result in an essentially static "Terasen Gas specific" solution that would not be able to take advantage of ongoing product development. Syclo also has a demonstrated compatibility with ClickSchedule. A simpler version of ClickSchedule is incorporated into the Syclo product. While not robust enough to replace ClickSoftware for Terasen Gas, it confirms the compatibility of the integration of the various technologies.

Since the ClickSchedule application is already used to support construction work and because the integration between ClickSchedule and the Syclo product was already proven, no other scheduling applications were considered appropriate for the proposed solution. Figure 2.3.1 shows the proposed technologies to manage the scheduling and dispatch of resources and work for Terasen Gas' mobile workforce.

Figure 2.3.1 Future State Technology Solution



2.4 Project Benefits, Costs and Customer Impacts and Final Choice of Options

The recommended solution for implementation that best aligns with the organization's strategic objectives and delivers substantial benefits to the Company and customers is Syclo's SMART, which includes the automation of field and timesheet data capture, and Click Software's' ClickSchedule applications for all work types. This solution supports the migration of all field work types and resources to a single resource management and schedule optimization platform. Implementation of the proposed solution will substantially improve operational processes associated with allocating, scheduling, assigning, dispatching and tracking resources and work assignments. The automation of field and timesheet data capture using Syclo's SMART application will improve data quality and eliminate manual data checking, error handling, and data entry processes.

2.4.1 Project Benefits

The Project has numerous operational benefits as outlined in Table 2.4.1 and will enable estimated annual O&M savings of $576,000 per year along with additional benefits that have not been quantified. The functionality delivered by the new system will result in numerous operational benefits. These benefits will primarily come from improved resource efficiency in the field, elimination of redundant processes in the office, reduction in manual data processing tasks, and stabilization of the technical environment. The solution forms the foundation required to successfully implement the Company's Field Mobile Workforce Strategy.

Table 2.4.1

Operating Benefit	**Annual Savings**
2.4.1.1 Improved Optimization of Field Resources	$350,000
2.4.1.2 Elimination of Complex, Duplicated, and Error Prone Resource Management Processes	$41,000
2.4.1.3 Field Resources Using a Single System	$42,000
2.4.1.4 Elimination of Manual Data Validation and Entry	$58,000
2.4.1.5 Elimination of Time and Costing Data Reconciliation	$57,500
2.4.1.6 Improved Communication between Dispatch and the Field	$27,500
2.4.1.7 Automation of Preventive Maintenance Processes	unquantifiable benefit
2.4.1.8 Access to Additional Data in the Field	unquantifiable benefit

2.4.1.9 Improved Communication between Dispatch and the Field	unquantifiable benefit
2.4.1.10 Simplification of Reporting	unquantifiable benefit
2.4.1.11 Stable and Supportable Systems	unquantifiable benefit
2.4.1.12 Enhanced Safety for Working Alone	unquantifiable benefit
2.4.1.13 Integrity Management Plan Audit Evidence	unquantifiable benefit

2.4.1.1 Improved Optimization of Field Resources

By eliminating the constraints caused by the current disparate dispatching systems, by introducing new scheduling and travel time optimization functionality, and by eliminating erroneous and duplicated site visits, it will be possible to reduce travel time and improve the efficiency with which field resources process work. The results will be two-fold: first, there will be less time charged to O&M expense, and second, there will be additional capacity for the technicians. The capacity created by this optimization will be filled by increasing the amount of planned Capital work assigned to technicians, which will also result in a reduction of the work performed by contractors. The scheduling efficiency increases will reduce the work that would typically go to an external construction contractor resulting in O&M savings.

Today, the mobile workforce is staffed at a level to ensure that Service Quality Indicators for emergency response are met, and that mandatory maintenance and improvement activities are completed. While this means it is challenging to further realize hard benefits through staff reductions in some areas, there is residual idle time capacity associated with the standby component of Emergency Response. The Company has pursued initiatives to optimize this residual capacity, but these efforts have been challenged by the deficiencies of the current technologies and processes. Tapping into this capacity will allow additional work to be scheduled during idle periods.

2.4.1.2 Elimination of Complex, Duplicated, and Error Prone Resource Management Processes

Implementation of the proposed solution will eliminate numerous redundant, error prone and overly complex processes that exist today in the resource management group in order to coordinate work and resources across the three dispatching systems. Use of ClickSchedule for scheduling of all resources will automate routine dispatching tasks, enabling dispatchers to focus more on handling exceptions and providing value-added planning support. Specifically, the proposed solution will eliminate the need to: raise duplicate work orders for many work

types, maintain resource skills and availabilities in multiple systems, manually coordinate which resources are supporting which work types, and manually maintain the Excel based “work and time-off schedules”.

2.4.1.3 Field Resources Using a Single System

Replacing the current three systems for field technicians to receive and process work with a single consistent system will reduce errors, reduce support requirements, and simplify the movement of technicians between job roles. This is particularly important given the Company’s high level of retiring field resources resulting in 25 new employees this year and 25 expected next year, in responding to the demographic challenge described in Section 2.2.2. A single system will significantly reduce the learning curve required to bring these new personnel up to speed with processing work.

2.4.1.4 Elimination of Manual Data Validation and Entry

Elimination of the manual entry, validation, and error handling of data for job closing, time collection, and payroll will reduce effort in the Closing and Time Administration groups within Terasen Gas. Not only is considerable effort required to simply process the current manually collected field data, but because much of this data is incomplete and contains errors, extra effort is involved in tracking down technicians to provide corrected data. By moving data validation to the field and automating the capture of much of the field data, a portion of the current clerical effort can be saved.

2.4.1.5 Elimination of Time and Costing Data Reconciliation

While the collection and posting of time data for customer service job costing has been automated, the payroll process of collecting timesheet information is still manual and paper-based. As a result, significant discrepancies appear each month between the data captured and what is reported on technicians’ timesheets that must be reconciled for consistent month-end reporting to occur. Because the proposed solution would automate both the time for costing and payroll processes, the effort involved in this reconciliation will be eliminated.

2.4.1.6 Improved Communication between Dispatch and the Field

The ability to see the status of all field resources and their work in real-time will improve the communication between the dispatchers and the field. This coupled with the improved access to data being provided to the field will reduce the number of cell phone calls made to the office.

2.4.1.7 Automation of PM Processes

Replacing the current dispatching method for PM work with the proposed solution will eliminate the manual processing involved in the current process.

2.4.1.8 Access to Additional Data in the Field

Providing technicians with access to additional data in the field – particularly history of work performed and problems previously reported at a site – will reduce the number of duplicate problems reported (and hence reduce the back-end processes currently in place to identify and eliminate these duplicates) and reduce the number of site visits by providing technicians with a view of other work that can be completed while at a site. Access to this data will also reduce the number of calls made to dispatch employees and the time required for the dispatchers to look-up the data and respond.

2.4.1.9 Improved Communication between Dispatch and the Field

The ability to see the status of all field resources and their work in real-time will improve the communication between the dispatchers and the field. This coupled with the improved access to data being provided to the field will reduce the number of cell phone calls made to the office.

2.4.1.10 Simplification of Reporting

Providing simplified and consistent reporting will provide managers with the ability to better measure technician performance and utilization. With the current disparate reporting, it is very difficult to obtain a comprehensive and consistent view of technician performance and as a result, technicians often receive limited feedback on performance from their managers.

2.4.1.11 Stable and Supportable Systems

The efficiency of field resources will further be improved by reducing the system outages incurred by the current set of technologies. Reduction of current system outages, that average two per month, will both improve the efficiency of field resources and reduce the manual workarounds for dispatchers during these periods. (Note: outage hours for 2006 were 76 hours, compared to a total of 56 hours for the 2005 year.)

2.4.1.12 Enhanced Safety for Working Alone

Current Work Safe BC regulations require a process to monitor the safety of employees who are working alone. Terasen Gas complies with this regulation by requiring employees working alone to call vial cell phone at prescribed time periods into an automated system. The proposed solution will eliminate the current cell phone based monitoring process by integrating this

functionality into the applications, thereby improving the effectiveness of these safety procedures.

2.4.1.13 Integrity Management Plan Audit Evidence

With the implementation of the Project as outlined, regulatory reporting requirements relating to a pipeline integrity management program would be addressed by means of automating the status, tracking and completion reporting of asset integrity work thus providing a more accurate and complete record. The proposed system will help provide sufficient audit evidence that would satisfy the requirements of the integrity management program as outlined in Annex N of the Canadian Standards Association Standard Z662 and directed by the Commission in Order No. G-34-07.

2.4.2 Project Capital Expenditures

With major components of the current system becoming increasingly unstable, the Company felt it prudent to include the estimated cost of a possible project in the 2005 and 2006 Annual Reviews without yet having the benefit of determining the full scope of work that would be required. In the 2005 Annual Review, Mobile Up is listed as a potential project with a capital cost of $2.0 million and again in the 2006 Annual Review, section 2.1.10 at a cost of $4.6million.

As the technical requirements of the proposed system were identified by the Company, vendors submitted request for proposals such that the capital costs and benefits could now be estimated with greater certainty as compared to the information available during preparation of the annual review filings.

The capital expenditure requirements for the project, for which the Company is seeking approval for as part of this CPCN Application, are set out in Table 2.4.2 below:

Table 2.4.2

	2007	2008	Totals
	Total	**Total**	**Total**
Internal Labour	**$337,329**	**$379,848**	**$717,176**
Consulting	**$1,219,679**	**$1,718,476**	**$2,938,155**
Hardware	**$150,000**	**$162,000**	**$312,000**
Software	**$568,436**	**$23,112**	**$591,548**
Expenses	**$144,136**	**$291,650**	**$435,786**
Contingency	**$78,974**	**$315,896**	**$394,869**
Total	**$2,498,554**	**$2,890,981**	**$5,389,535**
2006 Spend			$256,000
AFUDC			$338,732
Total			**$5,984,267**

Consistent with Order No. G-112-04, where 10% of the Terasen Gas SAP related costs were allocated to TGVI, the Company proposes that the same 10% proportional allocation of all costs for the Distribution Mobile Solution be used.

The $256,000 spent in 2006 is associated with the analysis of the current system deficiencies, development of a conceptual solution, the technical requirements documentation, and the RFP. Expenses in Table 2.4.2 relate to fixed fees for the consultants travel, accommodations and meals.

Consulting costs as listed in Table 2.4.2 relate to external project management, the technical expertise required to implement and install the proposed systems and installation of associated hardware. Terasen Gas' strategy has been to outsource for major project development. The Company is staffed to support ongoing operations and provide some functional expertise but is not staffed to implement large scale projects on its own. This model has allowed Terasen Gas to realize significant cost reductions over the years.

2.4.3 Revenue Requirement Impact

Revenue requirements are expected to increase marginally with the implementation of this project. However, as described in Section 2.3, the prospect of a do nothing scenario which

would essentially be the same as reverting to a manual system, would result in a much larger revenue requirement impact. The estimated revenue requirement impacts for TGI and TGVI resulting from the Project are summarized in Table 2.4.3 below:

Table 2.4.3

TGI REVENUE REQUIREMENT in thousands of $	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
Operating & maintenance	-	(259.6)	(519.2)	(519.2)	(519.2)	(519.2)	(519.2)
Depreciation & amortization	-	-	574.9	478.9	478.9	478.9	478.9
Interest	-	-	166.0	127.5	107.3	87.0	66.8
Income tax	-	(29.7)	278.6	241.6	235.3	234.9	231.9
ROE	-	-	115.1	88.4	74.4	60.3	46.3
Incremental Revenue Requirement	-	(289)	615	417	377	342	305

TGVI REVENUE REQUIREMENT in thousands of $	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
Operating & maintenance	-	(28.8)	(57.7)	(57.7)	(57.7)	(57.7)	(57.7)
Depreciation & amortization	-	-	63.9	53.2	53.2	53.2	53.2
Interest	-	-	13.1	10.1	8.5	6.9	5.3
Income tax	-	(3.3)	32.4	27.9	27.0	26.8	26.3
ROE	-	-	15.8	12.2	10.2	8.3	6.4
Incremental Revenue Requirement	-	(32)	68	46	41	38	33

Further financial schedules covering a 10 year period are attached as Appendix A.

3. PROJECT MANAGEMENT

3.1 Project Schedule

Table 5

Early May	2007	Submission of CPCN Application to the BCUC
End of June	2007	CPCN Approval received
Early July	2007	Secure Dedicated Vendor Resources
September 30	2007	Detailed Design Phase complete
October 1	2007	Development and Testing Phase begins
March 1	2008	Final Preparation for Go-Live Phase begins
May 31	2008	System goes live
August 31	2008	Stabilization Period and Project Complete

3.2 Risks

While all projects include some risk, considerable work has been done to ensure that Project risks have been or can be mitigated. This work includes ensuring that:

- The proposed solution supports the Company's overall Field Mobile Workforce Strategy and aligns with Terasen Gas' overall strategies;
- The business requirements for managing all types of field work are fully understood and well documented;
- The proposed solution is the best fit to meet the immediate business requirements and enable future growth;
- The selected solution vendors fully understand the requirements and Project scope, and have provided fixed-price bids for their implementation efforts; and
- The choice of vendors was validated with Gartner Research regarding their position in the market place and long-term outlook.

The specific areas of risk are outlined below.

3.2.1 Organizational Risk

Terasen Gas views the organizational impacts of having a common solution as minimal. Technician schedules and work allocation will continue to be managed centrally and no field

reorganization is required. While there will be some minor realignment of resources within the Operations Centre to accommodate the integrated work and resource model, streamlined processes and technology, the elimination of complex, redundant processes will be regarded as a positive change.

3.2.1.1 Mitigation:

The Project teams will include staff representation within affected departments on the development of new procedures and processes to ensure employees are engaged and understand the changes. A Project communication plan will be developed, and a regular communications established.

3.2.2 Employee & Process Risk

It is expected that there will be significant process changes that will affect the resourcing and dispatching group. Dispatchers specifically will be responsible for dispatching and balancing the three work streams (Construction, Preventative Maintenance and Customer Work). Although the technology implemented will provide them the capability to do this efficiently, training and change management efforts need to be directed to dispatchers to embrace the new processes and tools.

The impact on the technician workforce is expected to be low. Technicians will continue to perform their work as they currently do. The tools by which they communicate with the office will, however, change. All technicians and crews will need to be trained on using the new mobile application. Providing technicians with the tools to make their jobs more efficient will enhance their ability to exceed delivery standards. Resistance to the adoption of new technology and data capture processes should be minimal with appropriate training and change management. Therefore, the Company believes the risks associated with employees and related processes to be low.

3.2.2.1 Mitigation:

Terasen Gas Union representatives (C.O.P.E and I.B.E.W.) will be engaged early in the Project to ensure a common understanding of Project objectives, potential employee impacts and to establish communication protocols. A comprehensive stakeholder analysis will be developed as a basis for planning communications, training audiences and overall human resource impacts. The Project teams will include staff representation within affected departments on the development of new procedures and processes to

ensure employees are engaged and understand the changes. A Project communication plan will be developed, and regular communications established.

3.2.3 Budget & System Failure Risk

While extensive work has been undertaken to confirm the scope of the Project and to have the key vendors fix-price their components, no project can be 100% certain that additional funding will not be required. Due to the fact that the vendors are highly sought after, if work does not commence by the first week of July 2007, the Company believes that the Project schedule as outlined will be unattainable and the Project costs will rise. A delayed start will result in the necessity for Terasen Gas to go back and renegotiate with the vendors as it will not be possible for them to hold a project team for an extended period of time. The Company believes that such a delay will significantly increase the risk and frequency of outages and failure of the current system, resulting in higher O&M expenses to revert to manual processes during system outages.

3.2.3.1 Mitigation:

Extensive work has been undertaken over the past 9 months to confirm that the business requirements are fully understood and documented, that the vendors clearly understand the scope (Syclo was required to respond to an 78 page requirements document as part of the RFQ process, and Click Software has completed two sets of on-site requirements workshops), and to have the vendors provide fixed price bids for their work and expenses.

A dedicated Project manager will be in place for the duration of the Project to manage the Project, perform regular monthly reporting and monitor change management. This will ensure that costs are monitored and managed as well as deliverables are being met on schedule. Terasen Gas requests that the Commission complete its process to review this Application and reach a decision by the end of June, 2007 to avoid the necessity to renegotiate any aspects of the terms of the Project and to secure the cost, labour and proposed schedule guarantees for the Project, negotiated with and committed to by the proposed vendors during the RFP and RFQ processes. An expedited decision would minimize the risk of system outages and failure and the associated higher O&M expense exposure with the timely completion of the Project implementation.

3.2.4 Internal Resourcing

Critical to the Project's success is the availability of a few key employees from the IT department that also provide support for the current production environments. If major production issues occur through the course of the Project, these employees could be drawn away from the Project to respond to these urgent issues. This is partially a budget issue, as limited budget is available to provide backfill for these individuals, although some individuals cannot be effectively backfilled due to their unique skill sets. As with any major project, there will also be a draw on operational resources to provide subject matter expertise, testing support, documentation development, and training delivery.

3.2.4.1 Mitigation:

This risk is mitigated by the stability of the other systems such as SAP, the strength of the business team available to work on the Project, and by the Project start timing of allowing a holiday break for key individuals over the summer months of 2007. The Distribution Process Management department employees are all experienced with application implementations and will be able to provide Project support in areas normally delivered by the functional personnel from the IT department. Resource plans have been developed and reviewed with the impacted Terasen Gas managers to ensure the Project risk can be managed. The Project will have an internal steering committee made up of senior management who will ensure that resource conflicts are managed as effectively as possible.

3.2.5 Ability to Deliver Other Projects

As a result of the resource constraints, the IT department will have very limited ability to support any other initiatives between mid 2007 through mid 2008.

3.2.5.1 Mitigation:

Priority initiatives from all business units have been reviewed, prioritized and planned for. Any additional projects that have not already been identified will be deferred, or where prudent and practical implementation will be outsourced.

3.2.6 C.O.P.E. Contract Negotiations

The C.O.P.E. contract is scheduled to be renegotiated in 2007. Any work stoppage would impact the Project's ability to execute to schedule.

3.2.6.1 Mitigation:

Negotiations have commenced and both parties are targeting completion by mid 2007. Product development risk is mitigated as most vendor development work will be performed off site during the last four months of 2007. Any work disruptions in 2008 may affect testing and training and result in delay of implementation

3.2.7 Energy Upgrade Project Timing

The planned upgrade for Energy (which is Terasen Gas' Customer Information System) is schedule to be completed around March 1, 2008, which means the testing cycles for that project and the Distribution Mobile Solution Project should align unless changes to either project plan occur. The project teams will have to coordinate testing between Energy and the new system.

3.2.7.1 Mitigation:

This risk has been mitigated by simplifying the process interfaces with Energy such that the testing requirements will not be complex.

In summary, with the mitigation strategies listed above in Sections 3.2.2 through 3.2.7.1, the Company believes the overall Project risk to be low and manageable.

3.3 Health and Safety Management

Health and Safety values are a high priority for Terasen Gas. It is the Company's practice to identify, assess and control workplace hazards and ergonomics in a continually improving manner. The following elements will be addressed by the Project manager for all Project employees and contractors:

- Strict adherence to Terasen Gas' Health and Safety policies and procedures;
- Control measures to eliminate or reduce risks and hazards;
- Incident reporting, investigation and remediation; and
- Program documentation, records maintenance and administration.

Terasen Gas considers that there will be no increased risk to employee health and safety as a result of this Project.

3.4 Environmental Impact Assessment

There is no legislative requirement for environmental review of this Project.

3.5 Public Works / Infrastructure

The Project has no requirement for associated public works.

3.6 Public and First Nation Consultation

The Project has no requirement for public and First Nations consultation.

3.7 Other Applications and Approvals

No other approvals are required.

3.8 Structure and/or Ownership

Terasen Gas will own the asset associated with the Project, however, consistent with past practice for system related investments that are used to serve customers of both Terasen Gas and TGVI, 10% proportional allocation of all costs of the asset will be transferred to TGVI.

3.9 Conclusion

Terasen Gas submits that the implementation of a new Distribution Mobile Solution is in the public convenience and necessity as there is significant risk that the current system will fail due to technology age as demonstrated by increasing occurrences of system outages. A sustained outage would have significant implications on the Company's ability to dispatch, and thus efficiently perform full, day-to-day customer service work as well as resulting in a significant increase in its O&M expense, and could compromise the Company's ability to meet its SQI targets.

Terasen Gas considered three options for addressing its scheduling and dispatching circumstance, in order to facilitate the implementation of its Field Mobile Workforce Strategy. The first two, which were a "manual solution" approach and a "continuation of current solution" approach, were deemed to be undesirable and more costly than the third option, which was the implementation of a new solution. In assessing the alternatives for the implementation of a new solution, the Company performed an RFP process including three potential vendors, by which it concluded that an integrated solution utilizing Syclo's application, the subject of the RFP, with the existing SAP and ClickSoftware, was the preferred solution. Terasen Gas believes that it has performed an appropriate level of analysis in determining which option and alternative best meet its needs and has vetted those with an impartial third party consultant. The total capital

cost of the Distribution Mobile Solution is estimated to be $5.98 million, including AFUDC which will provide estimated annual Operating and Maintenance expense savings of $576,000, in addition to other important benefits not quantified. In comparison, the other options considered in the RFP process would have resulted in annual increase to O&M expense of approximately $1 million, and in addition to being more costly, lacked functionality as compared to the selected solution.

Terasen Gas requests that it be granted a CPCN allowing the Company to proceed with the proposed implementation, as it believes it is prudent and in the best interests of customers. Terasen Gas requests that the Commission review this CPCN in an expedited fashion such that the Company can commence project work at the beginning of July 2007 leading to Project completion by approximately August 31, 2008.

APPENDIX A: FINANCIALS

TGI ASSUMPTIONS	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Return on equity	8.37%	8.37%	8.37%	8.37%	8.37%	8.37%	8.37%	8.37%	8.37%	8.37%	8.37%
Cost of debt (1)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Cost of debt (2)	6.50%	6.50%	6.50%	6.50%	6.50%	6.50%	6.50%	6.50%	6.50%	6.50%	6.50%
Percentage of equity	35%	35.0%	35.0%	35.0%	35.0%	35.0%	35.0%	35.0%	35.0%	35.0%	35.0%
Percentage of debt (1)	0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Percentage of debt (2)	65%	65.0%	65.0%	65.0%	65.0%	65.0%	65.0%	65.0%	65.0%	65.0%	65.0%
WACC	5.80%	5.80%	5.80%	5.80%	5.85%	5.85%	5.85%	5.85%	5.85%	5.85%	5.85%
Pre-tax WACC	8.53%	8.53%	8.53%	8.53%	8.47%	8.47%	8.47%	8.47%	8.47%	8.47%	8.47%
Inflation	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
LCT	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
Tax Rate	32.0%	32.0%	32.0%	32.0%	31.0%	31.0%	31.0%	31.0%	31.0%	31.0%	31.0%
Surtax	0.00%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Tax rate	32.0%	32.0%	32.0%	32.0%	31.0%	31.0%	31.0%	31.0%	31.0%	31.0%	31.0%

TGVI ASSUMPTIONS	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Return on equity	9.07%	9.07%	9.07%	9.07%	9.07%	9.07%	9.07%	9.07%	9.07%	9.07%	9.07%
Cost of debt (1)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Cost of debt (2)	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%
Percentage of equity	40%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%
Percentage of debt (1)	0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Percentage of debt (2)	60%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%
WACC	5.67%	5.67%	5.67%	5.67%	5.70%	5.70%	5.70%	5.70%	5.70%	5.70%	5.70%
Pre-tax WACC	8.34%	8.34%	8.34%	8.34%	8.26%	8.26%	8.26%	8.26%	8.26%	8.26%	8.26%
Inflation	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
LCT	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
Tax Rate	32.0%	32.0%	32.0%	32.0%	31.0%	31.0%	31.0%	31.0%	31.0%	31.0%	31.0%
Surtax	0.00%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Tax rate	32.0%	32.0%	32.0%	32.0%	31.0%	31.0%	31.0%	31.0%	31.0%	31.0%	31.0%

TGI REVENUE REQUIREMENT in thousands of $	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Operating & maintenance	-	(259.6)	(519.2)	(519.2)	(519.2)	(519.2)	(519.2)	(519.2)	(519.2)	(519.2)	(519.2)
Depreciation & amortization	-	-	574.9	478.9	478.9	478.9	478.9	478.9	478.9	478.9	478.9
Interest	-	-	166.0	127.5	107.3	87.0	66.8	46.5	26.3	6.1	(14.2)
Income tax	-	(29.7)	278.6	241.6	235.3	234.9	231.9	227.4	222.1	215.6	210.7
ROE	-	-	115.1	88.4	74.4	60.3	46.3	32.3	18.2	4.2	(9.8)
Incremental Revenue Requirement	-	(289)	615	417	377	342	305	266	226	186	146

TGVI REVENUE REQUIREMENT in thousands of $	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Operating & maintenance	-	(28.8)	(57.7)	(57.7)	(57.7)	(57.7)	(57.7)	(57.7)	(57.7)	(57.7)	(57.7)
Depreciation & amortization	-	-	63.9	53.2	53.2	53.2	53.2	53.2	53.2	53.2	53.2
Interest	-	-	13.1	10.1	8.5	6.9	5.3	3.7	2.1	0.5	(1.1)
Income tax	-	(3.3)	32.4	27.9	27.0	26.8	26.3	25.7	24.9	24.0	23.3
ROE	-	-	15.8	12.2	10.2	8.3	6.4	4.4	2.5	0.6	(1.4)
Incremental Revenue Requirement	-	(32)	68	46	41	38	33	29	25	21	16

TGI CONTRIBUTION & GRANTS in thousands $	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Opening	-	-	(768.0)	(1,536.1)	(1,536.1)	(1,536.1)	(1,536.1)	(1,536.1)	(1,536.1)	(1,536.1)	(1,536.1)
Additions	-	(768.0)	(768.0)	-	-	-	-	-	-	-	-
Retirements											
Ending	-	(768.0)	(1,536.1)	(1,536.1)	(1,536.1)	(1,536.1)	(1,536.1)	(1,536.1)	(1,536.1)	(1,536.1)	(1,536.1)

TGI ACCUMULATED AMORTIZATION	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Opening	-	-	-	96.0	288.0	480.0	672.0	864.0	1,056.0	1,248.0	1,440.1
Depreciation	-	-	96.0	192.0	192.0	192.0	192.0	192.0	192.0	192.0	192.0
Retirements											
Ending	-	-	96.0	288.0	480.0	672.0	864.0	1,056.0	1,248.0	1,440.1	1,632.1

TGI NET CONTRIBUTION & GRANTS	-	(768.0)	(1,440.1)	(1,248.0)	(1,056.0)	(864.0)	(672.0)	(480.0)	(288.0)	(96.0)	96.0

TGVI CONTRIBUTION & GRANTS in thousands $	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Opening	-	-	(85.3)	(170.7)	(170.7)	(170.7)	(170.7)	(170.7)	(170.7)	(170.7)	(170.7)
Additions	-	(85.3)	(85.3)	-	-	-	-	-	-	-	-
Retirements											
Ending	-	(85.3)	(170.7)	(170.7)	(170.7)	(170.7)	(170.7)	(170.7)	(170.7)	(170.7)	(170.7)

TGVI ACCUMULATED AMORTIZATION	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Opening	-	-	-	10.7	32.0	53.3	74.7	96.0	117.3	138.7	160.0
Depreciation	-	-	10.7	21.3	21.3	21.3	21.3	21.3	21.3	21.3	21.3
Retirements											
Ending	-	-	10.7	32.0	53.3	74.7	96.0	117.3	138.7	160.0	181.3

TGVI NET CONTRIBUTION & GRANTS	-	(85.3)	(160.0)	(138.7)	(117.3)	(96.0)	(74.7)	(53.3)	(32.0)	(10.7)	10.7

TGI BALANCE SHEET IMPACT in thousands $	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Working capital	-	-	-	-	-	-	-	-	-	-	-
Plant	-	-	5,367.4	5,367.4	5,367.4	5,367.4	5,367.4	5,367.4	5,367.4	5,367.4	5,367.4
Accumulated Depreciation	-	-	(670.9)	(1,341.8)	(2,012.8)	(2,683.7)	(3,354.6)	(4,025.5)	(4,696.5)	(5,367.4)	(6,038.3)
Contributions and grants	-	(768.0)	(1,440.1)	(1,248.0)	(1,056.0)	(864.0)	(672.0)	(480.0)	(288.0)	(96.0)	96.0
Deferred charges	-	-	-	-	-	-	-	-	-	-	-
Future income taxes	-	-	-	-	-	-	-	-	-	-	-
Utility rate base	-	(768.0)	3,256.4	2,777.5	2,298.6	1,819.7	1,340.7	861.8	382.9	(96.0)	(574.9)
Work in Progress	2,530.0	5,367.4	-	-	-	-	-	-	-	-	-
Total investments	2,530.0	4,599.3	3,256.4	2,777.5	2,298.6	1,819.7	1,340.7	861.8	382.9	(96.0)	(574.9)
Debt	1,644.5	2,989.6	2,116.7	1,805.4	1,494.1	1,182.8	871.5	560.2	248.9	(62.4)	(373.7)
Equity	885.5	1,609.8	1,139.7	972.1	804.5	636.9	469.3	301.6	134.0	(33.6)	(201.2)
	2,530.0	4,599.3	3,256.4	2,777.5	2,298.6	1,819.7	1,340.7	861.8	382.9	(96.0)	(574.9)
Rate base (opening)			3,927.9	3,016.9	2,538.0	2,059.1	1,580.2	1,101.3	622.4	143.5	(335.5)

TGVI BALANCE SHEET IMPACT in thousands $	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Working capital	-	-	-	-	-	-	-	-	-	-	-
Plant	-	-	596.4	596.4	596.4	596.4	596.4	596.4	596.4	596.4	596.4
Accumulated Depreciation	-	-	(74.5)	(149.1)	(223.6)	(298.2)	(372.7)	(447.3)	(521.8)	(596.4)	(670.9)
Contributions and grants	-	(85.3)	(160.0)	(138.7)	(117.3)	(96.0)	(74.7)	(53.3)	(32.0)	(10.7)	10.7
Deferred charges	-	-	-	-	-	-	-	-	-	-	-
Future income taxes	-	-	-	-	-	-	-	-	-	-	-
Utility rate base	-	(85.3)	361.8	308.6	255.4	202.2	149.0	95.8	42.5	(10.7)	(63.9)
Work in Progress	281.1	596.4	-	-	-	-	-	-	-	-	-
Total investments	281.1	511.0	361.8	308.6	255.4	202.2	149.0	95.8	42.5	(10.7)	(63.9)
Debt	168.7	306.6	217.1	185.2	153.2	121.3	89.4	57.5	25.5	(6.4)	(38.3)
Equity	112.4	204.4	144.7	123.4	102.2	80.9	59.6	38.3	17.0	(4.3)	(25.6)
	281.1	511.0	361.8	308.6	255.4	202.2	149.0	95.8	42.5	(10.7)	(63.9)
Rate base (opening)			436.4	335.2	282.0	228.8	175.6	122.4	69.2	15.9	(37.3)

TGI CCA	in thousands $		**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Opening	Class 12			-	2,400	-	-	-	-	-	-	-	-
Additions			-	4,800	-	-	-	-	-	-	-	-	-
CCA	Rate	100.0%	-	(2,400)	(2,400)	-	-	-	-	-	-	-	-
Ending			-	2,400	-	-	-	-	-	-	-	-	-
Opening	Class 45			-	218	120	66	36	20	11	6	3	-
Additions			-	281	-	-	-	-	-	-	-	-	-
CCA	Rate	45.0%	-	(63)	(98)	(54)	(30)	(16)	(9)	(5)	(3)	(3)	-
Ending			-	218	120	66	36	20	11	6	3	-	-
Total	in thousands $												
Opening			-	-	2,618	120	66	36	20	11	6	3	-
Additions			-	5,081	-	-	-	-	-	-	-	-	-
CCA			-	(63)	(98)	(54)	(30)	(16)	(9)	(5)	(3)	(3)	-
Ending			-	5,018	2,520	66	36	20	11	6	3	-	-

TGI ACCUMULATED DEPRECIATION	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Opening	-	-	-	(636)	(1,272)	(1,907)	(2,543)	(3,179)	(3,815)	(4,451)	(5,087)
Depreciation	-	-	(636)	(636)	(636)	(636)	(636)	(636)	(636)	(636)	(636)
Retirements	-	-	-	-	-	-	-	-	-	-	-
Ending	-	-	(636)	(1,272)	(1,907)	(2,543)	(3,179)	(3,815)	(4,451)	(5,087)	(5,722)
Opening	-	-	-	(35)	(70)	(105)	(140)	(176)	(211)	(246)	(281)
Depreciation	-	-	(35)	(35)	(35)	(35)	(35)	(35)	(35)	(35)	(35)
Retirements	-	-	-	-	-	-	-	-	-	-	-
Ending	-	-	(35)	(70)	(105)	(140)	(176)	(211)	(246)	(281)	(316)
Total											
Opening	-	-	-	(671)	(1,342)	(2,013)	(2,684)	(3,355)	(4,026)	(4,696)	(5,367)
Depreciation	-	-	(671)	(671)	(671)	(671)	(671)	(671)	(671)	(671)	(671)
Retirement costs	-	-	-	-	-	-	-	-	-	-	-
Retirements	-	-	-	-	-	-	-	-	-	-	-
Ending	-	-	(671)	(1,342)	(2,013)	(2,684)	(3,355)	(4,026)	(4,696)	(5,367)	(6,038)