Appendix A, Permit for Stormwater Discharges Associated with Light Industrial Activity

STATE OF COLORADO

Bill Owens, Governor
Dennis E. Ellis, Executive Director

Dedicated to protecting and improving the health and environment of the people of Colorado

4300 Cherry Creek Dr. S.
Denver, Colorado 80246-1530
Phone (303) 692-2000
TDD Line (303) 691-7700
Located in Glendale, Colorado

http://www.cdphe.state.co.us

Laboratory Services Division
8100 Lowry Blvd.
Denver, Colorado 80230-6928
(303) 692-3090

Colorado Department
of Public Health
and Environment

CITY OF LOVELAND, CO
JUN 2006
Water & Power

June 15, 2006

Stephen C. Adams, Water Utility Mgr
Loveland, City of, WWTP
200 N. Wilson Avenue
Loveland, CO 80537
970/962-3400

RE: Final Permit, Colorado Discharge Permit System - Stormwater
Certification No. : **COR-011125**
Loveland, City of - Loveland WWTP
Larimer County

Local Contact: Johnny Tuxhorn, Water Treatment Mgr
970/ 962-2570

Dear Sir or Madam:

Enclosed please find a copy of the new permit and certification which have been re-issued to you under the Colorado Water Quality Control Act.

Your old permit expires on June 30, 2006. This is a renewal to the permit, and replaces the old one. See page 1 of the Rationale (the pages in italics) for a summary of the minor changes to the permit.

Your certification under the permit requires that specific actions be performed at designated times. You are legally obligated to comply with all terms and conditions of the permit.

Please read the permit and certification. If you have any questions, contact the Matt Czahor at (303) 692-3575 or Nathan Moore at (303) 692-3555.

Sincerely,

Kathryn Dolan
Stormwater Program Coordinator
Permits Section
Water Quality Control Division

CERTIFICATION

CDPS GENERAL PERMIT

STORMWATER DISCHARGES ASSOCIATED WITH

LIGHT INDUSTRY

Industrial Activity: WWTP.

Primary SIC code: 4952

This permit specifically authorizes: **Loveland, City of, WWTP**

to discharge stormwater from the facility identified as: Loveland WWTP

which is located at: 920 South Boise Avenue
Loveland, CO 80537

in: Larimer County

to: Big Thompson River

effective: 7/1/2006

Annual Fee: $232.00 (**DO NOT PAY NOW**. You will receive a bill later.)

Next Annual Report Due: 02/15/07

CDPS GENERAL PERMIT

STORMWATER DISCHARGES ASSOCIATED WITH
LIGHT INDUSTRIAL ACTIVITY

AUTHORIZATION TO DISCHARGE UNDER THE

COLORADO DISCHARGE PERMIT SYSTEM

In compliance with the provisions of the Colorado Water Quality Control Act, (25-8-101 et seq., CRS, 1973 as amended) and the Federal Water Pollution Control Act, as amended (33 U.S.C. 1251 et seq.; the "Act"), this permit authorizes the discharge of stormwater associated with light industrial activity certified under this permit, from those locations specified throughout the State of Colorado to specified waters of the State. Such discharges shall be in accordance with the conditions of this permit.

This permit specifically authorizes the facility listed on page 1 of this permit to discharge stormwater associated with light industrial activity, as of this date, in accordance with the permit requirements and conditions set forth in Parts I and II hereof. All discharges authorized herein shall be consistent with the terms and conditions of this permit.

This permit and the authorization to discharge shall expire at midnight, **June 30, 2011**.

Issued and Signed this 31st day of May, 2006.

COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT

Janet S. Kieler
Permits Section Manager
Water Quality Control Division

ISSUED AND SIGNED MAY 31, 2006

EFFECTIVE JULY 1, 2006

CDPS GENERAL PERMIT - LIGHT INDUSTRY

TABLE OF CONTENTS

PART I

PART I

A. COVERAGE UNDER THIS PERMIT

1. Authority to Discharge

Under this general permit, facilities engaged in light industrial activity as listed in Part I.A.5 are granted authorization to discharge stormwater associated with industrial activity into waters of the state of Colorado.

2. Application, Due Dates

a. **Application Due Dates:** At least **thirty days** prior to the anticipated date of discharge, the owner (or operator if the owner does not operate the facility) of the facility shall submit an application as provided by the Division.

One original of the completed permit application form shall be submitted to:

Colorado Department of Public Health and Environment
Water Quality Control Division
WQCD-P-B2
4300 Cherry Creek Drive South
Denver, Colorado 80246-1530

b. **Application Form:** The application form requires, at a minimum, the following information:

1) Name and address of principal in charge of operation of the facility;
2) Site address and location;
3) Facility contact person, phone number and email address (if available);
4) Standard Industrial Classification (SIC) code(s);
5) List of other environmental permits currently held by the facility;
6) Facility description/industrial activities which take place at the site;
7) Receiving waters; and
8) Certification as to the completion of a Stormwater Management Plan (SWMP).

3. Permit Certification Procedures

If the general permit is applicable, then a certification will be developed and the applicant will be certified under this general permit.

a. **Request for Additional Information:** The Division shall have up to **thirty days** after receipt of the above information to request additional data and/or deny the authorization for any particular discharge. Upon receipt of additional information, the Division shall have an additional **fifteen days** to issue or deny authorization for the particular discharge. (Notification of denial shall be by letter, in cases where coverage under an alternate general permit or an individual permit is required, instead of coverage under this general permit.)

b. **Automatic Coverage:** If the applicant does not receive a request for additional information or a notification of denial from the Division dated within thirty days of the receipt of the application by the Division, authorization to discharge in accordance with the conditions of this permit shall be deemed granted.

c. **Individual Permit Required:** If, after evaluation of the application (or additional information, such as the SWMP), it is found that this general permit is not applicable to the operation, then the application will be processed as one for an individual permit. The applicant will be notified of the Division's decision to deny certification under this general permit. For an individual permit, additional information may be requested, and 180 days will be required to process the application and issue the permit. Temporary coverage under this general permit may be allowed until the individual permit goes into effect.

A. COVERAGE UNDER THIS PERMIT (cont.)

pursuant to section 313 of SARA III; fertilizers; pesticides; and waste products such as ashes, slag and sludge that have the potential to be released with stormwater discharge.

6. **Individual Permit Criteria**

Various criteria can be used in evaluating whether or not an individual (or alternate general) permit is required instead of this general permit. This information may come from the application, SWMP, or additional information as requested by the Division, and includes, but is not limited to, the following:

a. the quality of the receiving waters (e.g., the presence of downstream drinking water intakes or a high quality fishery, or for preservation of high quality water);
b. the type of industry, including pollution potential;
c. the volume and type of materials handled;
d. the size of the facility;
e. evidence of noncompliance under a previous permit for the operation;
f. the use of chemicals within the stormwater system; or
g. discharges of pollutants of concern to waters for which there is a Total Maximum Daily Load (TMDL) established.

In addition, an individual permit may be required when the Division has shown or has reason to suspect that the stormwater discharge may contribute to a violation of a water quality standard.

7. **Mobile Asphalt and Concrete Batch Plants**

The Division has determined that, if adequately addressed by the facility's SWMP, the permit certification may be tied to the plant, as opposed to the site. The permittee's SWMP shall contain additional relevant information, such as the proposed standard Best Management Practices (BMPs) which would be used at each site, etc. The permittee must still meet the application, permit and SWMP requirements as described herein. **The permittee is required to summarize the current location and past locations of the plant for the previous year in the Annual Report.** See Part I.D.1 of the permit. As an alternative, a batch plant that is dedicated to a specific construction site may instead be covered under a CDPS Construction Stormwater general permit certification issued to that site, provided that the site's SWMP includes adequate provisions for the batch plant.

B. STORMWATER MANAGEMENT PLAN - CONTENTS AND REQUIREMENTS

A Stormwater Management Plan (SWMP) shall be developed for each facility covered by this permit. SWMPs shall include BMPs that are selected, installed, implemented and maintained in accordance with good engineering practices. (The plan need not be completed by a registered engineer.)

The plan shall identify potential sources of pollution which may reasonably be expected to affect the quality of stormwater discharges associated with industrial activity from the facility. In addition, the plan shall describe and ensure the implementation of practices which are to be used to reduce the pollutants in stormwater discharges associated with industrial activity at the facility and to assure compliance with the terms and conditions of this permit.

As a condition of this permit, facilities must implement the provisions of the SWMP required under this part. The Division reserves the right to review the plan, and to require additional measures to prevent and control pollution as needed.

Any SWMP prepared before June 30, 2006 that does not meet all of the requirements listed herein (especially those items required for the site map) must be amended to conform with the SWMP requirements in this permit. Such amendments must be completed within 60 days of the certification effective date (typically July 1, 2006).
The SWMP shall include the following items, at a minimum:

1. **Industrial Activity Description**

The plan shall provide a narrative description of the industrial activity taking place at the site.

B. STORMWATER MANAGEMENT PLAN - CONTENTS AND REQUIREMENTS (cont.)

3) Sediment and erosion prevention: The plan shall identify areas which, due to topography, activities, or other factors, have a high potential for significant soil erosion, and identify measures taken to limit erosion.

4) Other pollution prevention measures: The plan shall identify any other structural and non-structural measures for stormwater quality control on-site.

In each case where stormwater pollution potential exists, appropriate preventive measures must be taken and documented.

c. **Sampling Information:-** The plan shall include a summary of any existing discharge sampling data describing pollutants in stormwater discharges, and a description of each existing or proposed sampling point, if monitoring is required by the Division under Part I.D.2.

d. **Preventive Maintenance:** A preventive maintenance program is required, and shall involve inspection and maintenance of stormwater management devices (cleaning oil/water separators, catch basins, etc.) as well as inspecting and testing plant equipment and systems to uncover conditions that could cause breakdowns or failures resulting in discharges of pollutants to surface waters. These periodic inspections are different from the comprehensive site evaluation (see Part I.C.5), although the former may be incorporated into the latter. Equipment, area, or other inspections are typically visual and are normally conducted on a regular basis (e.g., daily inspections of loading areas).

e. **Good Housekeeping:** Good housekeeping requires the maintenance of a clean, orderly facility. This part of the SWMP shall address cleaning and maintenance schedules, trash collection and disposal practices, grounds maintenance, etc.

f. **Spill Prevention and Response Procedures:** Areas where potential spills can occur, and their accompanying drainage points, shall be identified clearly in the SWMP. Where appropriate, specifying material handling procedures and storage requirements in the plan shall be considered. Procedures for cleaning up spills shall be identified in the plan and made available to the appropriate personnel. The necessary equipment to implement a clean up shall be available to personnel.

g. **Employee Training:** Employee training programs shall inform personnel at all levels of responsibility (who are involved in industrial activities that may impact stormwater runoff) of the components and goals of the SWMP. Training shall address topics such as spill response, good housekeeping and material management practices. The SWMP shall identify periodic dates for such training. Contractor or temporary personnel shall be informed of plant operation and design features in order to prevent discharges or spills from occurring.

h. **Identification of Discharges other than Stormwater:** The stormwater conveyance system on the site shall be evaluated for the presence of discharges other than stormwater. The SWMP shall include a description of the results of any evaluation for the presence of discharges other than stormwater, the method used, the date of the evaluation, and the on-site drainage points that were directly observed during the evaluation.

A number of discharges other than stormwater may not require a CDPS Industrial Wastewater Discharge permit and are considered Allowable Non-Stormwater Discharges. Any of these discharges that exist at the site must be identified in the SWMP. See Part I.C.3.b of the permit for a list of such allowable discharges.

4. **Comprehensive Inspections**

The SWMP shall identify qualified personnel that shall inspect designated equipment and plant areas. The procedures and intervals of the comprehensive inspection shall also be specified in the plan and shall be consistent with Part I.C.5. Except as provided in paragraphs (d) and (e) of that part, comprehensive inspections shall in no case be completed less than twice a year (in the spring and fall). The operator shall keep a record of such inspections. This record shall be made available to the Division upon request and shall be summarized in the Annual Report.

C. OTHER TERMS AND CONDITIONS (cont.)

3. **Prohibition of Non-stormwater Discharges**

a. Except as provided in subsection b, below, **all discharges authorized by this permit shall be composed entirely of stormwater discharges associated with industrial activity**. Discharges of material other than stormwater must be addressed in a separate CDPS permit issued for that discharge.

b. Discharges from the following sources may be authorized by this permit, provided that:

1) appropriate control measures to minimize the impacts of such sources are implemented as needed; and
2) the non-stormwater component(s) of the discharge and the control measure(s) used are identified in the SWMP.

These sources include discharges from emergency fire fighting activities; fire hydrant flushing; potable water, including water line flushing; pavement wash waters where no detergents are used and no spills or leaks of toxic or hazardous materials have occurred (unless all spilled material has been removed); routine external building and sign washdown that does not use detergents; uncontaminated compressor condensate; irrigation drainage; lawn watering; air conditioner condensate; uncontaminated springs; foundation or footing drains where flows are not contaminated; and incidental windblown mist from cooling towers that collects on rooftops of adjacent portions of the facility, but NOT intentional discharges from the cooling tower.

4. **Releases in Excess of Reportable Quantities**

This permit does not relieve the permittee of the reporting requirements of 40 CFR 110, 40 CFR 117 or 40 CFR 302. Any discharge of hazardous substances must be handled in accordance with the Division's Notification Requirements (see Part II.A.3 of the permit).

5. **Comprehensive Facility Inspections**

In addition to the inspections necessary to comply with the preventive maintenance program requirements in Part I.B.3.d, qualified personnel identified by the permittee shall make a comprehensive inspection of their stormwater management system, at least twice per year (in the spring and fall), except as provided in paragraphs d and e, below. These comprehensive inspections must be documented and summarized in the Annual Report (see Part I.D.1 of the permit). Qualified personnel are those who possess the knowledge and skills to assess conditions and activities that could impact stormwater quality at the facility, and who can also evaluate the effectiveness of BMPs selected.

a. Material handling areas, disturbed areas, areas used for material storage that are exposed to precipitation, and other potential sources of pollution identified in the SWMP in accordance with Part I.B.3.b of this permit shall be inspected for evidence of, or the potential for, pollutants entering the drainage system. Structural stormwater management measures, sediment and control measures, and other structural pollution prevention measures identified in the plan shall be observed to ensure that they are operating correctly. A visual inspection of equipment needed to implement the plan, such as spill response equipment, shall be made to confirm that it is readily available and in proper working order.

b. Any repairs or maintenance needs identified by the inspection shall be completed immediately. Based on the results of the inspection, if revisions to the description of potential pollutant sources and pollution prevention measures identified in the plan are needed, the plan shall be revised as appropriate, and shall provide for implementation of any changes to the plan in a timely manner, and in compliance with the requirements of Part I.C.2.c.2.

c. A report summarizing the scope of the inspection, personnel making the inspection, the date(s) of the inspection, significant observations relating to the implementation of the SWMP, and actions taken in accordance with paragraph (b), above, shall be made and retained for at least three years after the date of the inspection. Significant observations include such things as the locations of discharges of pollutants from the site; locations of previously unidentified sources of pollutants; locations of BMPs needing maintenance or repair; locations of failed BMPs that need replacement; and locations where additional BMPs are needed. The report must also document any incidents of noncompliance observed.

D. MONITORING AND REPORTING (cont.)

f. For mobile asphalt and concrete batch plants, a description of the current location and past locations for the reporting year.

The Annual Report will be due to the Division on or before **February 15** of the following year (see address below). The exact due date for the permittee's first Annual Report will be listed in their certification. The first report may include less than twelve months of information, unless otherwise indicated in the certification. The Division reserves the right to require additional information in the report, on a case-by-case basis, as needed.

A signed copy of the above report form shall be submitted to the following address:

Colorado Department of Public Health and Environment
Water Quality Control Division
WQCD-P-B2
4300 Cherry Creek Drive South
Denver, Colorado 80246-1530

2. **Monitoring**

Sampling and testing of stormwater for specific parameters is not required on a routine basis under this permit. The Division reserves the right to require sampling and testing, on a case-by-case basis, in the event that there is reason to suspect that compliance with the SWMP is a problem, or to measure the effectiveness of the BMPs in removing pollutants in the effluent.

If monitoring is required, the following definitions apply:

a. The **thirty (30) day average** shall be determined by the arithmetic mean of all samples collected during a thirty (30) consecutive-day period.

b. A **grab** sample, for monitoring requirements, is a single "dip and take" sample.

3. **Reporting of Data**

Reporting of any monitoring data gathered in compliance with Part I.D.2 shall be on an annual basis, unless otherwise specified by the Division.

Monitoring results shall be summarized for each year (January 1-December 31) and reported on Division-approved discharge monitoring report forms and submitted to the Division with the Annual Report due **February 15** of each year at the address above.

4. **Reporting to Municipality**

Any permitted facility discharging to a municipal storm sewer shall provide the municipality with a copy of the permit application, and/or Annual Reports, upon request. A copy of the SWMP shall also be provided to the municipality upon request.

5. **Signatory Requirements**

a. All reports and applications submitted to the Division and/or EPA shall be signed and certified for accuracy by the permittee in accordance with the following criteria:

1) In the case of corporations, by a principal executive officer of at least the level of vice-president or his or her duly authorized representative, if such representative is responsible for the overall operation of the facility from which the discharge described in the form originates;
2) In the case of a partnership, by a general partner;
3) In the case of a sole proprietorship, by the proprietor;

E. GENERAL REQUIREMENTS (cont.)

2. **Record-keeping and Internal Reporting Procedures**

Incidents such as spills or other discharges, along with other information describing the quality and quantity of stormwater discharges, shall be included in the records. Inspections and maintenance activities shall be documented and recorded. The permittee shall retain such records for a minimum of three (3) years from the date generated. All reports required by the permit and/or the Division, and any relevant correspondence, shall be retained for a minimum of five (5) years from the date generated.

PART II

A. MANAGEMENT REQUIREMENTS

1. **Change in Discharge**

The permittee shall inform the Division (Permits Section) in writing of any intent to construct, install, or alter any process, facility, or activity that is likely to result in a new or altered discharge that is not composed entirely of stormwater and/or allowable non-stormwater discharges identified in Part I.C.3.b. Division notification is also required if the permittee significantly changes the industrial activities at the site such that the industrial activities are no longer consistent with the activity description and/or SIC Code(s) originally identified in the permit application. The permittee shall furnish the Division such plans and specifications which the Division deems reasonably necessary to evaluate the effect on the discharge and receiving stream. If applicable, this notification may be accomplished through submittal of an application for a CDPS process water permit authorizing the discharge. The SWMP shall be updated and implemented prior to the changes. Also see Part I.C.2.c.(2).

Any discharge to the waters of the State from a point source other than specifically authorized by this permit or a different CDPS permit is prohibited.

2. **Special Notifications - Definitions**

a. **Spill**: An unintentional release of solid or liquid material which may cause pollution of state waters.

b. **Upset**: An exceptional incident in which there is unintentional and temporary noncompliance with permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventative maintenance, or careless or improper operation.

3. **Noncompliance Notification**

a. If, for any reason, the permittee does not comply with or will be unable to comply with any discharge limitations, standards or permit requirements specified in this permit, except as addressed in sub-paragraph c. of this section, the permittee shall, at a minimum, provide the Water Quality Control Division and EPA with the following information:

1) A description of the discharge and cause of noncompliance;

2) The period of noncompliance, including exact dates and times and/or the anticipated time when the discharge will return to compliance; and

3) Steps being taken to reduce, eliminate, and prevent recurrence of the noncomplying discharge.

A. MANAGEMENT REQUIREMENTS (cont.)

8. **Minimization of Adverse Impact**

The permittee shall take all reasonable steps to minimize any adverse impact to waters of the State resulting from noncompliance with any terms and conditions specified in this permit, including such accelerated or additional monitoring as necessary to determine the nature and impact of the noncomplying discharge.

9. **Reduction, Loss, or Failure of Stormwater Controls**

The permittee has the duty to halt or reduce any activity if necessary to maintain compliance with the permit requirements. Upon reduction, loss, or failure of the stormwater control, the permittee shall, to the extent necessary to maintain compliance with its permit, control production, or remove all pollutant sources from exposure to stormwater, or both until the stormwater controls are restored or an alternative method of treatment/control is provided.

It shall not be a defense for a permittee in an enforcement action that it would be necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

10. **Proper Operation and Maintenance**

The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems only when necessary to achieve compliance with the conditions of the permit.

B. RESPONSIBILITIES

1. **Inspections and Right to Entry**

The permittee shall allow the Director of the State Water Quality Control Division, the EPA Regional Administrator, and/or their authorized representative(s), upon the presentation of credentials:

a. To enter upon the permittee's premises where a regulated facility or activity is located or in which any records are required to be kept under the terms and conditions of this permit;

b. At reasonable times to have access to and copy any records required to be kept under the terms and conditions of this permit and to inspect any monitoring equipment or monitoring method required in the permit; and

c. To enter upon the permittee's premises to investigate, within reason, any actual, suspected, or potential source of water pollution, or any violation of the Colorado Water Quality Control Act. The investigation may include, but is not limited to, the following: sampling of any discharge and/or process waters, the taking of photographs, interviewing permittee staff on alleged violations and other matters related to the permit, and access to any and all facilities or areas within the permittee's premises that may have any effect on the discharge, permit, or any alleged violation.

2. **Duty to Provide Information**

The permittee shall furnish to the Division, within the time frame specified by the Division , any information which the Division may request to determine whether cause exists for modifying, revoking and reissuing, or terminating coverage under this permit, or to determine compliance with this permit. The permittee shall also furnish to the Division, upon request, copies of records required to be kept by this permit.

B. RESPONSIBILITIES (cont.)

2) In the case of termination, the permittee has ceased any and all discharges to state waters and demonstrates to the Division there is no probability of further uncontrolled discharge(s) which may affect waters of the State. Alternately, the permit may not be needed and coverage may be terminated if the facility qualifies for the No Exposure Exclusion and the permittee complies with the requirements outlined in Section 61.3(2)(h) of the State Discharge Permit System Regulations;

3) The Division finds that the permittee has shown reasonable grounds consistent with the Federal and State statutes and regulations for such modification, amendment or termination;

4) Fee requirements of Section 61.15 of State Discharge Permit System Regulations have been met; and

5) Applicable requirements of public notice have been met.

5. **Permit Violations**

Failure to comply with any terms and/or conditions of this permit shall be a violation of this permit.

Dischargers of stormwater associated with industrial activity, as defined in the EPA Stormwater Regulation (40 CFR 122.26(b)(14), which do not obtain coverage under this or other Colorado general permits, or under an individual CDPS permit regulating industrial stormwater, will be in violation of the federal Clean Water Act and the Colorado Water Quality Control Act, 25-8-101. Failure to comply with CDPS permit requirements will also constitute a violation. Civil penalties for such violations may be up to $10,000 per day, and criminal pollution of state waters is punishable by fines of up to $25,000 per day.

6. **Legal Responsibilities**

The issuance of this permit does not convey any property or water rights in either real or personal property, or stream flows, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of Federal, State or local laws or regulations.

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject to under Section 311 (Oil and Hazardous Substance Liability) of the Clean Water Act.

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable State law or regulation under authority granted by Section 510 of the Clean Water Act.

7. **Severability**

The provisions of this permit are severable. If any provisions of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances and the application of the remainder of this permit shall not be affected.

8. **Renewal Application**

If the permittee desires to continue to discharge, a permit renewal application shall be submitted at least ninety (90) days before this permit expires. If the permittee anticipates that there will be no discharge after the expiration date of this permit, the Division shall be promptly notified so that it can terminate the permit in accordance with Part II.B.4.d.

9. **Confidentiality**

Except for data determined to be confidential under Section 308 of the Federal Clean Water Act and Regulations for the State Discharge Permit System 61.5(4), all reports prepared in accordance with the terms of this permit shall be available for public inspection at the offices of the Division. The permittee must state what is confidential at the time of submittal.

COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT
Water Quality Control Division
WQCD-P-B2
4300 Cherry Creek Drive South
Denver, Colorado 80246-1530

RATIONALE

STORMWATER DISCHARGES ASSOCIATED WITH LIGHT INDUSTRIAL ACTIVITY

GENERAL PERMIT IN COLORADO

THIRD RENEWAL

COLORADO DISCHARGE PERMIT NUMBER COR-010000

I. INTRODUCTION

The permit is for the regulation of stormwater runoff from a wide variety of types of light industry. This Rationale will explain the background of the Stormwater program, which industries are covered under this permit, how to apply for coverage under this permit, and what the permit requirements are.

A. Changes in this General Permit

1. *Small Municipal Exemption: The previous Rationale included a discussion of the exemption from industrial stormwater permitting for small municipalities. This exemption ended as of March 10, 2003. Municipalities under 100,000 population are now subject to the same stormwater permitting requirements for their industrial facilities (e.g., gravel pits, wastewater treatment plants, construction projects) as other facility owners and operators. See http://www.cdphe.state.co.us/wq/PermitsUnit/SW-Muni-Ind-QA.pdf for further information. No changes were made to the permit for this item.*

2. *Application Requirements: The permit application requirements have changed slightly to require an email address, if available. See Part I.A.2.b.*

3. *Temporary Coverage: Part I.A.3.d of the permit dealt with temporarily covering a facility under the general permit even if an individual permit is more appropriate. This section essentially duplicated the previous section, and so it has been deleted.*

4. *Batch Plants: Information has been added to Part I.A.7 of the permit, indicating that a batch plant that is dedicated to a specific construction site may instead be covered under a CDPS Construction Stormwater general permit certification issued to that site, provided that the site's SWMP includes adequate provisions for the batch plant.*

5. *Stormwater Management Plan (SWMP)*

   a) ***Compliance Schedule**: For newly certified facilities, if the SWMP prepared in conjunction with the permit application requires a compliance schedule, it generally shall not exceed **60 days**. See Part I.B.*

   b) ***Site Map**: The requirements for the SWMP have been changed to add several items to the site map, such as areas of industrial activities, potential pollutant sources, and sampling point. If a permittee's existing SWMP does not already contain these items, **the plan must be amended** to comply with these changes, by **September 1, 2006**. See Part I.B.2.*

   c) ***SWMP Certification**: The previous permit included a requirement that the copy of Stormwater Management Plan that remains at the facility had to include the certification language and signature, as described in Part I.D.5.a. This requirement has been deleted. The signatory requirements of Part I.D.5.a **only** apply to the SWMP if it is to be submitted to the Division or to EPA. See Part I.C.2.b.*

II. BACKGROUND

The Environmental Protection Agency (EPA) requires that industrial stormwater discharges be regulated under the National Pollutant Discharge Elimination System (NPDES) program. (Note: The Colorado program is referred to as the Colorado Discharge Permit System, or CDPS, instead of NPDES). The Water Quality Control Division ("the Division") has stormwater regulations (5CCR 1002-61) in place. These regulations require specific types of industrial facilities that discharge stormwater associated with industrial activity (industrial stormwater), to obtain a CDPS permit for such discharge. A facility which discharges industrial stormwater either directly to surface waters or indirectly, such as through municipal separate storm sewers, must be covered by a permit.

A. General Permits

The Division has determined that the use of general permits is the appropriate procedure for handling most of the thousands of industrial stormwater applications within the State.

1. Types of General Permits: This permit covers a broad range of light industrial activities (see Section III.A of the Rationale). Other stormwater general permits cover industrial activities for heavy industry, auto recycling, sand and gravel operations, construction activities and mining.

2. General vs. Individual Permit Coverage: Currently unpermitted facilities which the Division determines need to be covered under an individual permit (see criteria in Part I.A.6 of the permit) may be temporarily covered under a general permit, if the Division determines that the benefits of immediate coverage outweigh the difference in permit requirements. The temporary coverage will be inactivated once an individual permit is issued (see Part I.A.3.c).

   Certification of a facility under a general permit does not in any way infringe on the Division's right to revoke that coverage and issue an individual permit or amend an existing individual permit, when such specialized facility attention is required.

B. Categorical Industries

Discharges of industrial stormwater must meet all applicable provisions of Sections 301 and 402 of the Clean Water Act. These provisions require control of pollutant discharges from categorical industries to a level equivalent to Best Available Technology Economically Achievable (BAT) and Best Conventional Pollutant Control Technology (BCT), and any more stringent controls necessary to meet water quality standards.

EPA regulations (40 CFR, Subchapter N) establish numeric effluent limitations for stormwater discharges from facilities in some of the industrial categories. For these facilities, the numeric effluent limitations constitute BAT and BCT for the specified pollutants, and must be met to comply with this program. Currently, all facility types with numeric effluent limits for stormwater are covered under the general permit for Heavy Industrial Activity, COR-020000. See the permit for Heavy Industry for a list of affected industries.

C. Permit Requirements

This permit does not require submission of effluent monitoring data in the permit application or in the permit itself. These light industries are considered to typically have a low potential for pollutant levels in their stormwater discharges which would cause a water quality impact, due to the nature of activities occurring on site and the types of materials handled.

The narrative requirements include prohibitions against discharges of non-stormwater. They require dischargers to control and eliminate the sources of pollutants in stormwater through the development and implementation of a Stormwater Management Plan (SWMP). The plan must include BMPs, which may include treatment of stormwater discharges along with source reduction. As per EPA, a fully implemented SWMP will constitute compliance with BAT and BCT. It is believed that BMPs are all that is necessary to control water quality impacts. If the Division determines that additional requirements are necessary, they may be imposed as follows: 1) at the renewal of this general permit or through an industry-special general permit if the issue is categorical; 2) through direction from the Division based on the implementation of a TMDL if the issue is watershed-based; or 3) if the issue is site-specific, through guidance from the Division, based on an inspection or SWMP review or through an individual permit.

III. STORMWATER DISCHARGES ASSOCIATED WITH INDUSTRIAL ACTIVITY (cont.)

Transportation facilities which have vehicle maintenance, fueling, equipment cleaning or airport deicing, including:

40	*Railroad transportation*
41	*Local and suburban transit and interurban highway passenger transportation*
42	*Motor freight transportation and warehousing (except 4221, 4222, 4225)*
43	*U.S. Postal Facilities**
44	*Water transportation*
45	*Air transportation (facilities that use less than 1000 gallons of deicer(s) annually, and/or that have annual fuel sales of less than one million gallons/year)*
5171	*Petroleum bulk stations & terminals*

**The Division currently does not have permitting authority over federal facilities. Should this change during the life of this permit, facilities under SIC Code 43 may be covered by this permit.*

Although the Office of Management and Budget's North American Industry Classification System is intended to replace the 1987 Standard Industrial Classification Code, Colorado has decided to continue using the 1987 SIC code system as the primary classification system under Colorado's stormwater permits because the stormwater regulations (Colorado Discharge Permit Regulations, Reg. 61) refer to these codes and because this code system identifies facilities adequately. EPA is implementing the same policy in its Multi-Sector General Permit.

For any facilities that do not require coverage under the stormwater regulations, but still wish to be covered under this general permit, the Division reserves the right to certify them under this permit.

The Division also reserves the right to include under this general permit any specific facility not otherwise covered. This determination would be based on the reasonable potential of a specific industrial discharger to contribute to a violation of a water quality standard, or to be a significant contributor of pollutants to state waters.

IV. APPLICATION AND CERTIFICATION

Certification under the permit requires submittal of an application. Upon receipt of all required information, the Division may allow or disallow coverage under the general permit. See Part I.A.3 of the permit for an outline of the applicable time frames.

*At least **thirty days** prior to the anticipated date of discharge, the owner (or operator when the owner does not operate the facility) of the facility shall submit an application as provided by the Division. (**Note** - Under the Federal regulations, this is referred to as a **Notice of Intent**, or **NOI**. For internal consistency with its current program, the Division will continue to use the term "application.")*

Refer to Part I.A.2.b of the permit for a description of what must be included in an application for coverage under this permit.

If this general permit is applicable, then a certification will be developed and the applicant will be certified under this general permit.

V. TERMS AND CONDITIONS OF PERMIT

A. ***Stormwater Management Plans (SWMPs)**: The purpose of a SWMP is to identify possible pollutant sources to stormwater and to set out best management practices that, when implemented, will reduce or eliminate any possible water quality impacts. A SWMP shall be developed for each facility covered by this permit. SWMPs shall include BMPs that are selected, installed, implemented and maintained in accordance with good engineering practices to minimize pollutants in the discharge so that the discharge will not cause or contribute to an excursion above any applicable water quality standards. (The plan need not be completed by a registered engineer.)*

The Division has a guidance document available on preparing a SWMP. The document is on the Division's website at www.cdphe.state.co.us/wq/PermitsUnit.

VII. RESPONSE TO PUBLIC NOTICE COMMENTS

The Division received comments on the proposed amendment from the Environmental Protection Agency. Based on these comments, the following changes/clarifications were made to the renewal permit:

A. ***Temporary Coverage:*** *Part I.A.3.d was deleted, as it was redundant. See Section I.A.3 of the Rationale.*

B. ***Batch Plants:*** *Part I.A.7 has been expanded to provide additional explanatory information about permit coverage for asphalt and concrete batch plants. See Section I.A.4 of the Rationale.*

Kathryn Dolan
May 25, 2006

Appendix B, SARA Title 313 Substances

Appendix C, Spill Report Form

Appendix D, Training Documentation

Appendix E, Inspection Report Forms

Appendix F, Records of Spills and Leaks

Appendix G, Monitoring Records

STATE OF COLORADO

Bill Owens, Governor
Dennis E. Ellis, Executive Director

Dedicated to protecting and improving the health and environment of the people of Colorado

4300 Cherry Creek Dr. S.
Denver, Colorado 80246-1530
Phone (303) 692-2000
TDD Line (303) 691-7700
Located in Glendale, Colorado

http://www.cdphe.state.co.us

Laboratory Services Division
8100 Lowry Blvd.
Denver, Colorado 80230-6928
(303) 692-3090

Colorado Department
of Public Health
and Environment

CITY OF LOVELAND, CO
JUN 19 2006
Water & Power

June 15, 2006

Stephen C. Adams, Water Utility Mgr
Loveland, City of, WWTP
200 N. Wilson Avenue
Loveland, CO 80537
970/962-3400

RE: Final Permit, Colorado Discharge Permit System - Stormwater
Certification No. : **COR-011125**
Loveland, City of - Loveland WWTP
Larimer County

Local Contact: Johnny Tuxhorn, Water Treatment Mgr
970/ 962-2570

Dear Sir or Madam:

Enclosed please find a copy of the new permit and certification which have been re-issued to you under the Colorado Water Quality Control Act.

Your old permit expires on June 30, 2006. This is a renewal to the permit, and replaces the old one. See page 1 of the Rationale (the pages in italics) for a summary of the minor changes to the permit.

Your certification under the permit requires that specific actions be performed at designated times. You are legally obligated to comply with all terms and conditions of the permit.

Please read the permit and certification. If you have any questions, contact the Matt Czahor at (303) 692-3575 or Nathan Moore at (303) 692-3555.

Sincerely,

Kathryn Dolan
Stormwater Program Coordinator
Permits Section
Water Quality Control Division

CERTIFICATION

CDPS GENERAL PERMIT

STORMWATER DISCHARGES ASSOCIATED WITH

LIGHT INDUSTRY

Industrial Activity: WWTP.

Primary SIC code: 4952

This permit specifically authorizes: **Loveland, City of, WWTP**

to discharge stormwater from the facility identified as: Loveland WWTP

which is located at: 920 South Boise Avenue
Loveland, CO 80537

in: Larimer County

to: Big Thompson River

effective: 7/1/2006

Annual Fee: $232.00 (**DO NOT PAY NOW.** You will receive a bill later.)

Next Annual Report Due: 02/15/07

CDPS GENERAL PERMIT

STORMWATER DISCHARGES ASSOCIATED WITH
LIGHT INDUSTRIAL ACTIVITY

AUTHORIZATION TO DISCHARGE UNDER THE

COLORADO DISCHARGE PERMIT SYSTEM

In compliance with the provisions of the Colorado Water Quality Control Act, (25-8-101 et seq., CRS, 1973 as amended) and the Federal Water Pollution Control Act, as amended (33 U.S.C. 1251 et seq.; the "Act"), this permit authorizes the discharge of stormwater associated with light industrial activity certified under this permit, from those locations specified throughout the State of Colorado to specified waters of the State. Such discharges shall be in accordance with the conditions of this permit.

This permit specifically authorizes the facility listed on page 1 of this permit to discharge stormwater associated with light industrial activity, as of this date, in accordance with the permit requirements and conditions set forth in Parts I and II hereof. All discharges authorized herein shall be consistent with the terms and conditions of this permit.

This permit and the authorization to discharge shall expire at midnight, **June 30, 2011**.

Issued and Signed this 31st day of May, 2006.

COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT

Janet S. Kieler
Permits Section Manager
Water Quality Control Division

ISSUED AND SIGNED MAY 31, 2006

EFFECTIVE JULY 1, 2006

CDPS GENERAL PERMIT - LIGHT INDUSTRY

TABLE OF CONTENTS

PART I

PART I

A COVERAGE UNDER THIS PERMIT

1. **Authority to Discharge**

Under this general permit, facilities engaged in light industrial activity as listed in Part I.A.5 are granted authorization to discharge stormwater associated with industrial activity into waters of the state of Colorado.

2. **Application, Due Dates**

a. **Application Due Dates:** At least **thirty days** prior to the anticipated date of discharge, the owner (or operator if the owner does not operate the facility) of the facility shall submit an application as provided by the Division.

One original of the completed permit application form shall be submitted to:

Colorado Department of Public Health and Environment
Water Quality Control Division
WQCD-P-B2
4300 Cherry Creek Drive South
Denver, Colorado 80246-1530

b. **Application Form:** The application form requires, at a minimum, the following information:

1) Name and address of principal in charge of operation of the facility;
2) Site address and location;
3) Facility contact person, phone number and email address (if available);
4) Standard Industrial Classification (SIC) code(s);
5) List of other environmental permits currently held by the facility;
6) Facility description/industrial activities which take place at the site;
7) Receiving waters; and
8) Certification as to the completion of a Stormwater Management Plan (SWMP).

3. **Permit Certification Procedures**

If the general permit is applicable, then a certification will be developed and the applicant will be certified under this general permit.

a. **Request for Additional Information:** The Division shall have up to **thirty days** after receipt of the above information to request additional data and/or deny the authorization for any particular discharge. Upon receipt of additional information, the Division shall have an additional **fifteen days** to issue or deny authorization for the particular discharge. (Notification of denial shall be by letter, in cases where coverage under an alternate general permit or an individual permit is required, instead of coverage under this general permit.)

b. **Automatic Coverage:** If the applicant does not receive a request for additional information or a notification of denial from the Division dated within thirty days of the receipt of the application by the Division, authorization to discharge in accordance with the conditions of this permit shall be deemed granted.

c. **Individual Permit Required:** If, after evaluation of the application (or additional information, such as the SWMP), it is found that this general permit is not applicable to the operation, then the application will be processed as one for an individual permit. The applicant will be notified of the Division's decision to deny certification under this general permit. For an individual permit, additional information may be requested, and 180 days will be required to process the application and issue the permit. Temporary coverage under this general permit may be allowed until the individual permit goes into effect.

COVERAGE UNDER THIS PERMIT (cont.)

pursuant to section 313 of SARA III; fertilizers; pesticides; and waste products such as ashes, slag and sludge that have the potential to be released with stormwater discharge.

6. **Individual Permit Criteria**

Various criteria can be used in evaluating whether or not an individual (or alternate general) permit is required instead of this general permit. This information may come from the application, SWMP, or additional information as requested by the Division, and includes, but is not limited to, the following:

a. the quality of the receiving waters (e.g., the presence of downstream drinking water intakes or a high quality fishery, or for preservation of high quality water);
b. the type of industry, including pollution potential;
c. the volume and type of materials handled;
d. the size of the facility;
e. evidence of noncompliance under a previous permit for the operation;
f. the use of chemicals within the stormwater system; or
g. discharges of pollutants of concern to waters for which there is a Total Maximum Daily Load (TMDL) established.

In addition, an individual permit may be required when the Division has shown or has reason to suspect that the stormwater discharge may contribute to a violation of a water quality standard.

7. **Mobile Asphalt and Concrete Batch Plants**

The Division has determined that, if adequately addressed by the facility's SWMP, the permit certification may be tied to the plant, as opposed to the site. The permittee's SWMP shall contain additional relevant information, such as the proposed standard Best Management Practices (BMPs) which would be used at each site, etc. The permittee must still meet the application, permit and SWMP requirements as described herein. **The permittee is required to summarize the current location and past locations of the plant for the previous year in the Annual Report.** See Part I.D.1 of the permit. As an alternative, a batch plant that is dedicated to a specific construction site may instead be covered under a CDPS Construction Stormwater general permit certification issued to that site, provided that the site's SWMP includes adequate provisions for the batch plant.

B. STORMWATER MANAGEMENT PLAN - CONTENTS AND REQUIREMENTS

A Stormwater Management Plan (SWMP) shall be developed for each facility covered by this permit. SWMPs shall include BMPs that are selected, installed, implemented and maintained in accordance with good engineering practices. (The plan need not be completed by a registered engineer.)

The plan shall identify potential sources of pollution which may reasonably be expected to affect the quality of stormwater discharges associated with industrial activity from the facility. In addition, the plan shall describe and ensure the implementation of practices which are to be used to reduce the pollutants in stormwater discharges associated with industrial activity at the facility and to assure compliance with the terms and conditions of this permit.

As a condition of this permit, facilities must implement the provisions of the SWMP required under this part. The Division reserves the right to review the plan, and to require additional measures to prevent and control pollution as needed.

Any SWMP prepared before June 30, 2006 that does not meet all of the requirements listed herein (especially those items required for the site map) must be amended to conform with the SWMP requirements in this permit. Such amendments must be completed within 60 days of the certification effective date (typically July 1, 2006).
The SWMP shall include the following items, at a minimum:

1. **Industrial Activity Description**

The plan shall provide a narrative description of the industrial activity taking place at the site.

B STORMWATER MANAGEMENT PLAN - CONTENTS AND REQUIREMENTS (cont.)

3) Sediment and erosion prevention: The plan shall identify areas which, due to topography, activities, or other factors, have a high potential for significant soil erosion, and identify measures taken to limit erosion.

4) Other pollution prevention measures: The plan shall identify any other structural and non-structural measures for stormwater quality control on-site.

In each case where stormwater pollution potential exists, appropriate preventive measures must be taken and documented.

c. **Sampling Information:-** The plan shall include a summary of any existing discharge sampling data describing pollutants in stormwater discharges, and a description of each existing or proposed sampling point, if monitoring is required by the Division under Part I.D.2.

d. **Preventive Maintenance:** A preventive maintenance program is required, and shall involve inspection and maintenance of stormwater management devices (cleaning oil/water separators, catch basins, etc.) as well as inspecting and testing plant equipment and systems to uncover conditions that could cause breakdowns or failures resulting in discharges of pollutants to surface waters. These periodic inspections are different from the comprehensive site evaluation (see Part I.C.5), although the former may be incorporated into the latter. Equipment, area, or other inspections are typically visual and are normally conducted on a regular basis (e.g., daily inspections of loading areas).

e. **Good Housekeeping:** Good housekeeping requires the maintenance of a clean, orderly facility. This part of the SWMP shall address cleaning and maintenance schedules, trash collection and disposal practices, grounds maintenance, etc.

f. **Spill Prevention and Response Procedures:** Areas where potential spills can occur, and their accompanying drainage points, shall be identified clearly in the SWMP. Where appropriate, specifying material handling procedures and storage requirements in the plan shall be considered. Procedures for cleaning up spills shall be identified in the plan and made available to the appropriate personnel. The necessary equipment to implement a clean up shall be available to personnel.

g. **Employee Training:** Employee training programs shall inform personnel at all levels of responsibility (who are involved in industrial activities that may impact stormwater runoff) of the components and goals of the SWMP. Training shall address topics such as spill response, good housekeeping and material management practices. The SWMP shall identify periodic dates for such training. Contractor or temporary personnel shall be informed of plant operation and design features in order to prevent discharges or spills from occurring.

h. **Identification of Discharges other than Stormwater:** The stormwater conveyance system on the site shall be evaluated for the presence of discharges other than stormwater. The SWMP shall include a description of the results of any evaluation for the presence of discharges other than stormwater, the method used, the date of the evaluation, and the on-site drainage points that were directly observed during the evaluation.

A number of discharges other than stormwater may not require a CDPS Industrial Wastewater Discharge permit and are considered Allowable Non-Stormwater Discharges. Any of these discharges that exist at the site must be identified in the SWMP. See Part I.C.3.b of the permit for a list of such allowable discharges.

4. **Comprehensive Inspections**

The SWMP shall identify qualified personnel that shall inspect designated equipment and plant areas. The procedures and intervals of the comprehensive inspection shall also be specified in the plan and shall be consistent with Part I.C.5. Except as provided in paragraphs (d) and (e) of that part, comprehensive inspections shall in no case be completed less than twice a year (in the spring and fall). The operator shall keep a record of such inspections. This record shall be made available to the Division upon request and shall be summarized in the Annual Report.

C OTHER TERMS AND CONDITIONS (cont.)

3. **Prohibition of Non-stormwater Discharges**

a. Except as provided in subsection b, below, **all discharges authorized by this permit shall be composed entirely of stormwater discharges associated with industrial activity**. Discharges of material other than stormwater must be addressed in a separate CDPS permit issued for that discharge.

b. Discharges from the following sources may be authorized by this permit, provided that:

1) appropriate control measures to minimize the impacts of such sources are implemented as needed; and
2) the non-stormwater component(s) of the discharge and the control measure(s) used are identified in the SWMP.

These sources include discharges from emergency fire fighting activities; fire hydrant flushing; potable water, including water line flushing; pavement wash waters where no detergents are used and no spills or leaks of toxic or hazardous materials have occurred (unless all spilled material has been removed); routine external building and sign washdown that does not use detergents; uncontaminated compressor condensate; irrigation drainage; lawn watering; air conditioner condensate; uncontaminated springs; foundation or footing drains where flows are not contaminated; and incidental windblown mist from cooling towers that collects on rooftops of adjacent portions of the facility, but NOT intentional discharges from the cooling tower.

4. **Releases in Excess of Reportable Quantities**

This permit does not relieve the permittee of the reporting requirements of 40 CFR 110, 40 CFR 117 or 40 CFR 302. Any discharge of hazardous substances must be handled in accordance with the Division's Notification Requirements (see Part II.A.3 of the permit).

5. **Comprehensive Facility Inspections**

In addition to the inspections necessary to comply with the preventive maintenance program requirements in Part I.B.3.d, qualified personnel identified by the permittee shall make a comprehensive inspection of their stormwater management system, at least twice per year (in the spring and fall), except as provided in paragraphs d and e, below. These comprehensive inspections must be documented and summarized in the Annual Report (see Part I.D.1 of the permit). Qualified personnel are those who possess the knowledge and skills to assess conditions and activities that could impact stormwater quality at the facility, and who can also evaluate the effectiveness of BMPs selected.

a. Material handling areas, disturbed areas, areas used for material storage that are exposed to precipitation, and other potential sources of pollution identified in the SWMP in accordance with Part I.B.3.b of this permit shall be inspected for evidence of, or the potential for, pollutants entering the drainage system. Structural stormwater management measures, sediment and control measures, and other structural pollution prevention measures identified in the plan shall be observed to ensure that they are operating correctly. A visual inspection of equipment needed to implement the plan, such as spill response equipment, shall be made to confirm that it is readily available and in proper working order.

b. Any repairs or maintenance needs identified by the inspection shall be completed immediately. Based on the results of the inspection, if revisions to the description of potential pollutant sources and pollution prevention measures identified in the plan are needed, the plan shall be revised as appropriate, and shall provide for implementation of any changes to the plan in a timely manner, and in compliance with the requirements of Part I.C.2.c.2.

c. A report summarizing the scope of the inspection, personnel making the inspection, the date(s) of the inspection, significant observations relating to the implementation of the SWMP, and actions taken in accordance with paragraph (b), above, shall be made and retained for at least three years after the date of the inspection. Significant observations include such things as the locations of discharges of pollutants from the site; locations of previously unidentified sources of pollutants; locations of BMPs needing maintenance or repair; locations of failed BMPs that need replacement; and locations where additional BMPs are needed. The report must also document any incidents of noncompliance observed.

MONITORING AND REPORTING (cont.)

f. For mobile asphalt and concrete batch plants, a description of the current location and past locations for the reporting year.

The Annual Report will be due to the Division on or before **February 15** of the following year (see address below). The exact due date for the permittee's first Annual Report will be listed in their certification. The first report may include less than twelve months of information, unless otherwise indicated in the certification. The Division reserves the right to require additional information in the report, on a case-by-case basis, as needed.

A signed copy of the above report form shall be submitted to the following address:

Colorado Department of Public Health and Environment
Water Quality Control Division
WQCD-P-B2
4300 Cherry Creek Drive South
Denver, Colorado 80246-1530

2. **Monitoring**

Sampling and testing of stormwater for specific parameters is not required on a routine basis under this permit. The Division reserves the right to require sampling and testing, on a case-by-case basis, in the event that there is reason to suspect that compliance with the SWMP is a problem, or to measure the effectiveness of the BMPs in removing pollutants in the effluent.

If monitoring is required, the following definitions apply:

a. The **thirty (30) day average** shall be determined by the arithmetic mean of all samples collected during a thirty (30) consecutive-day period.

b. A **grab** sample, for monitoring requirements, is a single "dip and take" sample.

3. **Reporting of Data**

Reporting of any monitoring data gathered in compliance with Part I.D.2 shall be on an annual basis, unless otherwise specified by the Division.

Monitoring results shall be summarized for each year (January 1-December 31) and reported on Division-approved discharge monitoring report forms and submitted to the Division with the Annual Report due **February 15** of each year at the address above.

4. **Reporting to Municipality**

Any permitted facility discharging to a municipal storm sewer shall provide the municipality with a copy of the permit application, and/or Annual Reports, upon request. A copy of the SWMP shall also be provided to the municipality upon request.

5. **Signatory Requirements**

a. All reports and applications submitted to the Division and/or EPA shall be signed and certified for accuracy by the permittee in accordance with the following criteria:

1) In the case of corporations, by a principal executive officer of at least the level of vice-president or his or her duly authorized representative, if such representative is responsible for the overall operation of the facility from which the discharge described in the form originates;
2) In the case of a partnership, by a general partner;
3) In the case of a sole proprietorship, by the proprietor;

F GENERAL REQUIREMENTS (cont.)

2. **Record-keeping and Internal Reporting Procedures**

Incidents such as spills or other discharges, along with other information describing the quality and quantity of stormwater discharges, shall be included in the records. Inspections and maintenance activities shall be documented and recorded. The permittee shall retain such records for a minimum of three (3) years from the date generated. All reports required by the permit and/or the Division, and any relevant correspondence, shall be retained for a minimum of five (5) years from the date generated.

PART II

A. MANAGEMENT REQUIREMENTS

1. **Change in Discharge**

The permittee shall inform the Division (Permits Section) in writing of any intent to construct, install, or alter any process, facility, or activity that is likely to result in a new or altered discharge that is not composed entirely of stormwater and/or allowable non-stormwater discharges identified in Part I.C.3.b. Division notification is also required if the permittee significantly changes the industrial activities at the site such that the industrial activities are no longer consistent with the activity description and/or SIC Code(s) originally identified in the permit application. The permittee shall furnish the Division such plans and specifications which the Division deems reasonably necessary to evaluate the effect on the discharge and receiving stream. If applicable, this notification may be accomplished through submittal of an application for a CDPS process water permit authorizing the discharge. The SWMP shall be updated and implemented prior to the changes. Also see Part I.C.2.c.(2).

Any discharge to the waters of the State from a point source other than specifically authorized by this permit or a different CDPS permit is prohibited.

2. **Special Notifications - Definitions**

a. **Spill**: An unintentional release of solid or liquid material which may cause pollution of state waters.

b. **Upset**: An exceptional incident in which there is unintentional and temporary noncompliance with permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventative maintenance, or careless or improper operation.

3. **Noncompliance Notification**

a. If, for any reason, the permittee does not comply with or will be unable to comply with any discharge limitations, standards or permit requirements specified in this permit, except as addressed in sub-paragraph c. of this section, the permittee shall, at a minimum, provide the Water Quality Control Division and EPA with the following information:

1) A description of the discharge and cause of noncompliance;

2) The period of noncompliance, including exact dates and times and/or the anticipated time when the discharge will return to compliance; and

3) Steps being taken to reduce, eliminate, and prevent recurrence of the noncomplying discharge.

A MANAGEMENT REQUIREMENTS (cont.)

8. **Minimization of Adverse Impact**

The permittee shall take all reasonable steps to minimize any adverse impact to waters of the State resulting from noncompliance with any terms and conditions specified in this permit, including such accelerated or additional monitoring as necessary to determine the nature and impact of the noncomplying discharge.

9. **Reduction, Loss, or Failure of Stormwater Controls**

The permittee has the duty to halt or reduce any activity if necessary to maintain compliance with the permit requirements. Upon reduction, loss, or failure of the stormwater control, the permittee shall, to the extent necessary to maintain compliance with its permit, control production, or remove all pollutant sources from exposure to stormwater, or both until the stormwater controls are restored or an alternative method of treatment/control is provided.

It shall not be a defense for a permittee in an enforcement action that it would be necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

10. **Proper Operation and Maintenance**

The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems only when necessary to achieve compliance with the conditions of the permit.

RESPONSIBILITIES

1. **Inspections and Right to Entry**

The permittee shall allow the Director of the State Water Quality Control Division, the EPA Regional Administrator, and/or their authorized representative(s), upon the presentation of credentials:

a. To enter upon the permittee's premises where a regulated facility or activity is located or in which any records are required to be kept under the terms and conditions of this permit;

b. At reasonable times to have access to and copy any records required to be kept under the terms and conditions of this permit and to inspect any monitoring equipment or monitoring method required in the permit; and

c. To enter upon the permittee's premises to investigate, within reason, any actual, suspected, or potential source of water pollution, or any violation of the Colorado Water Quality Control Act. The investigation may include, but is not limited to, the following: sampling of any discharge and/or process waters, the taking of photographs, interviewing permittee staff on alleged violations and other matters related to the permit, and access to any and all facilities or areas within the permittee's premises that may have any effect on the discharge, permit, or any alleged violation.

2. **Duty to Provide Information**

The permittee shall furnish to the Division, within the time frame specified by the Division , any information which the Division may request to determine whether cause exists for modifying, revoking and reissuing, or terminating coverage under this permit, or to determine compliance with this permit. The permittee shall also furnish to the Division, upon request, copies of records required to be kept by this permit.

F RESPONSIBILITIES (cont.)

2) In the case of termination, the permittee has ceased any and all discharges to state waters and demonstrates to the Division there is no probability of further uncontrolled discharge(s) which may affect waters of the State. Alternately, the permit may not be needed and coverage may be terminated if the facility qualifies for the No Exposure Exclusion and the permittee complies with the requirements outlined in Section 61.3(2)(h) of the State Discharge Permit System Regulations;

3) The Division finds that the permittee has shown reasonable grounds consistent with the Federal and State statutes and regulations for such modification, amendment or termination;

4) Fee requirements of Section 61.15 of State Discharge Permit System Regulations have been met; and

5) Applicable requirements of public notice have been met.

5. **Permit Violations**

Failure to comply with any terms and/or conditions of this permit shall be a violation of this permit.

Dischargers of stormwater associated with industrial activity, as defined in the EPA Stormwater Regulation (40 CFR 122.26(b)(14), which do not obtain coverage under this or other Colorado general permits, or under an individual CDPS permit regulating industrial stormwater, will be in violation of the federal Clean Water Act and the Colorado Water Quality Control Act, 25-8-101. Failure to comply with CDPS permit requirements will also constitute a violation. Civil penalties for such violations may be up to $10,000 per day, and criminal pollution of state waters is punishable by fines of up to $25,000 per day.

6. **Legal Responsibilities**

The issuance of this permit does not convey any property or water rights in either real or personal property, or stream flows, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of Federal, State or local laws or regulations.

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject to under Section 311 (Oil and Hazardous Substance Liability) of the Clean Water Act.

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable State law or regulation under authority granted by Section 510 of the Clean Water Act.

7. **Severability**

The provisions of this permit are severable. If any provisions of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances and the application of the remainder of this permit shall not be affected.

8. **Renewal Application**

If the permittee desires to continue to discharge, a permit renewal application shall be submitted at least ninety (90) days before this permit expires. If the permittee anticipates that there will be no discharge after the expiration date of this permit, the Division shall be promptly notified so that it can terminate the permit in accordance with Part II.B.4.d.

9. **Confidentiality**

Except for data determined to be confidential under Section 308 of the Federal Clean Water Act and Regulations for the State Discharge Permit System 61.5(4), all reports prepared in accordance with the terms of this permit shall be available for public inspection at the offices of the Division. The permittee must state what is confidential at the time of submittal.

COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT
Water Quality Control Division
WQCD-P-B2
4300 Cherry Creek Drive South
Denver, Colorado 80246-1530

RATIONALE

STORMWATER DISCHARGES ASSOCIATED WITH LIGHT INDUSTRIAL ACTIVITY

GENERAL PERMIT IN COLORADO

THIRD RENEWAL

COLORADO DISCHARGE PERMIT NUMBER COR-010000

I. INTRODUCTION

The permit is for the regulation of stormwater runoff from a wide variety of types of light industry. This Rationale will explain the background of the Stormwater program, which industries are covered under this permit, how to apply for coverage under this permit, and what the permit requirements are.

A. Changes in this General Permit

1. *Small Municipal Exemption: The previous Rationale included a discussion of the exemption from industrial stormwater permitting for small municipalities. This exemption ended as of March 10, 2003. Municipalities under 100,000 population are now subject to the same stormwater permitting requirements for their industrial facilities (e.g., gravel pits, wastewater treatment plants, construction projects) as other facility owners and operators. See http://www.cdphe.state.co.us/wq/PermitsUnit/SW-Muni-Ind-QA.pdf for further information. No changes were made to the permit for this item.*

2. *Application Requirements: The permit application requirements have changed slightly to require an email address, if available. See Part I.A.2.b.*

3. *Temporary Coverage: Part I.A.3.d of the permit dealt with temporarily covering a facility under the general permit even if an individual permit is more appropriate. This section essentially duplicated the previous section, and so it has been deleted.*

4. *Batch Plants: Information has been added to Part I.A.7 of the permit, indicating that a batch plant that is dedicated to a specific construction site may instead be covered under a CDPS Construction Stormwater general permit certification issued to that site, provided that the site's SWMP includes adequate provisions for the batch plant.*

5. *Stormwater Management Plan (SWMP)*

   a) ***Compliance Schedule**: For newly certified facilities, if the SWMP prepared in conjunction with the permit application requires a compliance schedule, it generally shall not exceed **60 days**. See Part I.B.*

   b) ***Site Map**: The requirements for the SWMP have been changed to add several items to the site map, such as areas of industrial activities, potential pollutant sources, and sampling point. If a permittee's existing SWMP does not already contain these items, **the plan must be amended** to comply with these changes, by **September 1, 2006**. See Part I.B.2.*

   c) ***SWMP Certification**: The previous permit included a requirement that the copy of Stormwater Management Plan that remains at the facility had to include the certification language and signature, as described in Part I.D.5.a. This requirement has been deleted. The signatory requirements of Part I.D.5.a **only** apply to the SWMP if it is to be submitted to the Division or to EPA. See Part I.C.2.b.*

II. BACKGROUND

The Environmental Protection Agency (EPA) requires that industrial stormwater discharges be regulated under the National Pollutant Discharge Elimination System (NPDES) program. (Note: The Colorado program is referred to as the Colorado Discharge Permit System, or CDPS, instead of NPDES). The Water Quality Control Division ("the Division") has stormwater regulations (5CCR 1002-61) in place. These regulations require specific types of industrial facilities that discharge stormwater associated with industrial activity (industrial stormwater), to obtain a CDPS permit for such discharge. A facility which discharges industrial stormwater either directly to surface waters or indirectly, such as through municipal separate storm sewers, must be covered by a permit.

A. General Permits

The Division has determined that the use of general permits is the appropriate procedure for handling most of the thousands of industrial stormwater applications within the State.

1. *Types of General Permits: This permit covers a broad range of light industrial activities (see Section III.A of the Rationale). Other stormwater general permits cover industrial activities for heavy industry, auto recycling, sand and gravel operations, construction activities and mining.*

2. *General vs. Individual Permit Coverage: Currently unpermitted facilities which the Division determines need to be covered under an individual permit (see criteria in Part I.A.6 of the permit) may be temporarily covered under a general permit, if the Division determines that the benefits of immediate coverage outweigh the difference in permit requirements. The temporary coverage will be inactivated once an individual permit is issued (see Part I.A.3.c).*

   Certification of a facility under a general permit does not in any way infringe on the Division's right to revoke that coverage and issue an individual permit or amend an existing individual permit, when such specialized facility attention is required.

B. Categorical Industries

Discharges of industrial stormwater must meet all applicable provisions of Sections 301 and 402 of the Clean Water Act. These provisions require control of pollutant discharges from categorical industries to a level equivalent to Best Available Technology Economically Achievable (BAT) and Best Conventional Pollutant Control Technology (BCT), and any more stringent controls necessary to meet water quality standards.

EPA regulations (40 CFR, Subchapter N) establish numeric effluent limitations for stormwater discharges from facilities in some of the industrial categories. For these facilities, the numeric effluent limitations constitute BAT and BCT for the specified pollutants, and must be met to comply with this program. Currently, all facility types with numeric effluent limits for stormwater are covered under the general permit for Heavy Industrial Activity, COR-020000. See the permit for Heavy Industry for a list of affected industries.

C. Permit Requirements

This permit does not require submission of effluent monitoring data in the permit application or in the permit itself. These light industries are considered to typically have a low potential for pollutant levels in their stormwater discharges which would cause a water quality impact, due to the nature of activities occurring on site and the types of materials handled.

The narrative requirements include prohibitions against discharges of non-stormwater. They require dischargers to control and eliminate the sources of pollutants in stormwater through the development and implementation of a Stormwater Management Plan (SWMP). The plan must include BMPs, which may include treatment of stormwater discharges along with source reduction. As per EPA, a fully implemented SWMP will constitute compliance with BAT and BCT. It is believed that BMPs are all that is necessary to control water quality impacts. If the Division determines that additional requirements are necessary, they may be imposed as follows: 1) at the renewal of this general permit or through an industry-special general permit if the issue is categorical; 2) through direction from the Division based on the implementation of a TMDL if the issue is watershed-based; or 3) if the issue is site-specific, through guidance from the Division, based on an inspection or SWMP review or through an individual permit.

III. STORMWATER DISCHARGES ASSOCIATED WITH INDUSTRIAL ACTIVITY (cont.)

Transportation facilities which have vehicle maintenance, fueling, equipment cleaning or airport deicing, including:

40	*Railroad transportation*
41	*Local and suburban transit and interurban highway passenger transportation*
42	*Motor freight transportation and warehousing (except 4221, 4222, 4225)*
43	*U.S. Postal Facilities**
44	*Water transportation*
45	*Air transportation (facilities that use less than 1000 gallons of deicer(s) annually, and/or that have annual fuel sales of less than one million gallons/year)*
5171	*Petroleum bulk stations & terminals*

**The Division currently does not have permitting authority over federal facilities. Should this change during the life of this permit, facilities under SIC Code 43 may be covered by this permit.*

Although the Office of Management and Budget's North American Industry Classification System is intended to replace the 1987 Standard Industrial Classification Code, Colorado has decided to continue using the 1987 SIC code system as the primary classification system under Colorado's stormwater permits because the stormwater regulations (Colorado Discharge Permit Regulations, Reg. 61) refer to these codes and because this code system identifies facilities adequately. EPA is implementing the same policy in its Multi-Sector General Permit.

For any facilities that do not require coverage under the stormwater regulations, but still wish to be covered under this general permit, the Division reserves the right to certify them under this permit.

The Division also reserves the right to include under this general permit any specific facility not otherwise covered. This determination would be based on the reasonable potential of a specific industrial discharger to contribute to a violation of a water quality standard, or to be a significant contributor of pollutants to state waters.

APPLICATION AND CERTIFICATION

Certification under the permit requires submittal of an application. Upon receipt of all required information, the Division may allow or disallow coverage under the general permit. See Part I.A.3 of the permit for an outline of the applicable time frames.

*At least **thirty days** prior to the anticipated date of discharge, the owner (or operator when the owner does not operate the facility) of the facility shall submit an application as provided by the Division. (**Note** - Under the Federal regulations, this is referred to as a **Notice of Intent**, or **NOI**. For internal consistency with its current program, the Division will continue to use the term "application.")*

Refer to Part I.A.2.b of the permit for a description of what must be included in an application for coverage under this permit.

If this general permit is applicable, then a certification will be developed and the applicant will be certified under this general permit.

V. TERMS AND CONDITIONS OF PERMIT

*A. **Stormwater Management Plans (SWMPs)**: The purpose of a SWMP is to identify possible pollutant sources to stormwater and to set out best management practices that, when implemented, will reduce or eliminate any possible water quality impacts. A SWMP shall be developed for each facility covered by this permit. SWMPs shall include BMPs that are selected, installed, implemented and maintained in accordance with good engineering practices to minimize pollutants in the discharge so that the discharge will not cause or contribute to an excursion above any applicable water quality standards. (The plan need not be completed by a registered engineer.)*

The Division has a guidance document available on preparing a SWMP. The document is on the Division's website at www.cdphe.state.co.us/wq/PermitsUnit.

VII. RESPONSE TO PUBLIC NOTICE COMMENTS

7 ivision received comments on the proposed amendment from the Environmental Protection Agency. Based on these comments, the following changes/clarifications were made to the renewal permit:

A. ***Temporary Coverage:*** *Part I.A.3.d was deleted, as it was redundant. See Section I.A.3 of the Rationale.*

B. ***Batch Plants:*** *Part I.A.7 has been expanded to provide additional explanatory information about permit coverage for asphalt and concrete batch plants. See Section I.A.4 of the Rationale.*

Kathryn Dolan
May 25, 2006

Report

City of Loveland Wastewater Treatment Plant Stormwater Management Plan

Prepared for

City of Loveland
Department of Water and Power
200 North Wilson Avenue
Loveland, Colorado 80537

March 2003

Updated January , 2008

CH2MHILL

9193 South Jamaica Street
Englewood, Colorado 80112

1. Introduction

Under the Colorado Department of Public Health and Environment, Water Quality Control Division (CDPHE-WQCD) Colorado Discharge Permit System (CDPS), domestic wastewater treatment facilities are considered "associated with light industrial activity." Colorado Regulation 61.3(2)(e)(iii)(I) requires permits for stormwater discharges associated with industrial activity as described in the federal regulations. The federal regulations, 40 CFR 122.26, describes an industrial activity in part as:

> "Treatment works treating domestic sewage or any other sewage sludge or wastewater treatment device or system, used in the storage treatment recycling, and reclamation of municipal domestic sludge, including land dedicated to the disposal of sewage sludge that are located within the confines of the facility, with a design flow of 1.0 mgd or more, or required to have an approved pretreatment program under 40 CFR part 403. Not included are farm lands, domestic gardens or lands used for sludge management where sludge is beneficially reused and which are not physically located in the confines of the facility, or areas that are in compliance with section 405 of the CWA."

The CDPHE has issued a general permit that covers discharges associated with light industrial activity including domestic wastewater treatment works (Appendix A). This permit requires the development and implementation of a Storm Water Management Plan (SWMP). This plan is meant to comply with this requirement.

1.1 Pollution Prevention Team

Name:	Michael McCrary
Title:	Interim WWTP Manager
Phone:	(970) 962-2572
Responsibilities:	Responsible for storm water pollution prevention activities at the Loveland Wastewater Treatment Plant. These responsibilities include:

(a) Updating the SWMP as required.

(b) Performing semi-annual inspections of the facility.

(c) Ensuring that storm water pollution prevention is included in employee training classes.

(d) Supervising spill and leak cleanup.

(e) Supervising facility and procedural changes identified to minimize pollutant exposure to storm water.

Name:	Stephen Adams
Title:	Water Utility Manager
Phone:	(970) 962-3559
Responsibilities:	Supervises the Treatment Manager in implementing and updating the SWMP. In the event that the Treatment Manager is unavailable, he assumes the responsibilities outlined above.

1.2 Revision History

Initial Date: March 6, 2003	By: CH2M HILL
Revision Date: 12-10-2003	By: Johnny Tuxhorn/Al Paquet
Revision Date: 01-26-2005	By: Al Paquet
Revision Date: 01/09/2008	By: Michael McCrary
Revision Date:	By:
Revision Date:	By:
Revision Date:	By:
Revision Date:	By:
Revision Date:	By:
Revision Date:	By:
Revision Date:	By:
Revision Date:	By:

1.3 Certification of SWMP

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

Signature: _____

Name: Stephen C. Adams

Title: Water Utility Manager

Certification Date: _____

2. Facility Description

The purpose of this section is to describe the wastewater treatment plant facility and the processes that occur at the facility.

2.1 Background

The Loveland Wastewater Treatment Plant (WWTP) was built to protect the waters of the Big Thompson River from raw sewage discharges. The WWTP includes those processes necessary to remove solids, floating material and pollutant loading that would otherwise deplete the natural assimilative capacity of the Big Thompson River. In this manner, the Loveland WWTP also protects the beneficial uses designated by the State of Colorado for the Big Thompson River. Regulation 38 – *Classification and Numeric Standards for South Platte River Basin, Laramie River Basin, Republican River Basin, Smokey Hill River Basin* defines those beneficial uses as Class 1a Recreation (May 1 through October 15), Class 2 Recreation (October 16 through April 30), Warm Water Aquatic Life Class 2, and Agricultural Use.

2.1.1 Location

The WWTP is located in the southern portion of the City at 920 South Boise Avenue, approximately one quarter mile north of County Road 402 on County Road 11E. The plant lies within the Big Thompson River drainage basin. The WWTP primarily treatsdomestic and commercial wastewater and discharges treated effluent to the Big Thompson River.

The WWTP was originally designed and constructed in 1960 as a primary treatment plant. The plant was upgraded to a secondary treatment plant in the early 1970s using a two-stage trickling filter process. Further expansion was completed in 1984 and 1986 to increase treatment capacity to 8.0 mgd. The City completed Wastewater Treatment Plant improvements in 2005 that increased the treatment capacity to 10.0 mgd.

2.1.1 WWTP Processes

The WWTP collects wastewater from the City of Loveland. The plant influent travels through the Headworks Building where a grinder/screen removes larger materials, washes the material, and discharges the screenings to a dumpster bin. The aerated grit chamber allows grit to settle while solids are suspended. Settled grit is discharged to the grit classifier. The classifier washes the grit material and conveys it to a dumpster, located inside the Headworks Building. The waste material in the dumpster is collected on a weekly basis. Influent flows to the aerated grit tanks that remove grit material. The grit is collected in a grit hopper in the Headworks Building. On a weekly basis, the material is hauled offsite.

Screw pumps convey the aerated grit effluent from the grit tanks and to the two primary clarifiers. In the primary clarifiers, some of the more dense materials are removed through settling. The material removed from the wastewater in the primary clarifier is pumped to the Digester Building from the primary sludge pump station. After digestion, the material is conveyed to the sludge loadout area and discharged into a truck. The truck loading

operation is performed outdoors on the south side of the existing Chlorine/Sulfur Dioxide Building. Digested solids are hauled via trucks to an application site located off of the WWTP property. The material is land applied in accordance with the City's Biosolids Disposal Program.

Primary clarifier effluent travels to a splitter box where the flow is split into the two trickling filters. The trickling filters have a bypass to the aeration basins that may be used if flows are high. From the trickling filters, flow is lifted at the aeration lift station and sent to the aeration basins.

The treatment plant has Six aeration basins that operate in parallel trains of three basins in a step feed process. Return activated sludge (RAS) from the secondary clarifiers is returned to the head of the aeration basins.. Flow leaves the aeration basins and travels to a splitter box where the flow is split into the two secondary clarifiers.

Additional solids are settled out in the secondary clarifiers. These solids are collected and conveyed to the dissolved air flotation (DAF) thickener for solids thickening. Supernatant from the DAF thickener are conveyed to the head of the plant. Thickened solids are pumped to the Digester Building. As with the primary clarifier solids, the digested material is conveyed to the sludge loadout area and hauled to an application site located off of the WWTP property.

Downstream of the secondary clarifiers, the flow is combined and flows by gravity to the Ultraviolet Disinfection (UV) Facility. The UV facility has two operating channels each with two banks of lamps. Down stream magnetic flow meters are used to pace the lamp intensity and the number of channels and banks in service. . The disinfected plant effluent is discharged into the plant effluent pipe and subsequently flows into the Big Thompson River.

The WWTP is served by underground electrical service, from two separate sources, and is equipped with a standby engine generator capable of supporting critical loads such as the UV Disinfection Facility. The standby diesel engine generator set was constructed as part of the WWTP improvements project completed in 2005.

No vehicle maintenance occurs on site. Washing of vehicles is performed at the Sludge Holding Tank Building. This area is not covered and waters flow south to the storm drain inlets along the plant roadway.

The digested solids load out area is located outdoors, south of the former Chlorine/Sulfur Dioxide Building now used for Storage. The loading area is washed every day or so by the truck drivers. An inlet is located in this load-out area to ensure that the wash down water is collected. Wash waters are collected in the inlet and routed to the filtrate pump station where the waters are pumped to the head of the wastewater treatment plant.

2.2 Maps

Figure 1 shows a vicinity map for the City's wastewater treatment plant. Figure 2 provides a site plan with the facility structures, outfalls, runoff drainage areas and ground cover characteristics identified.

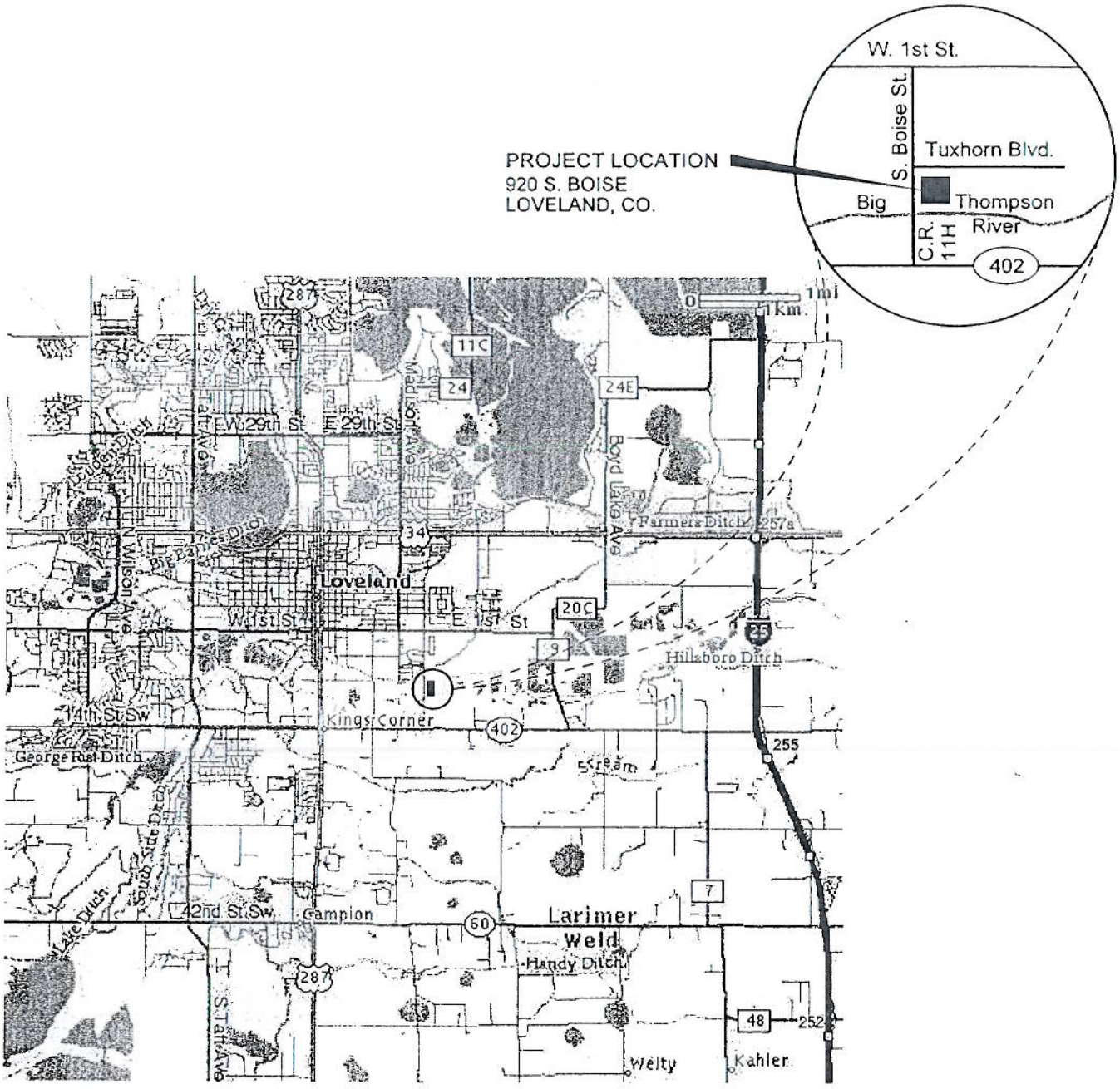
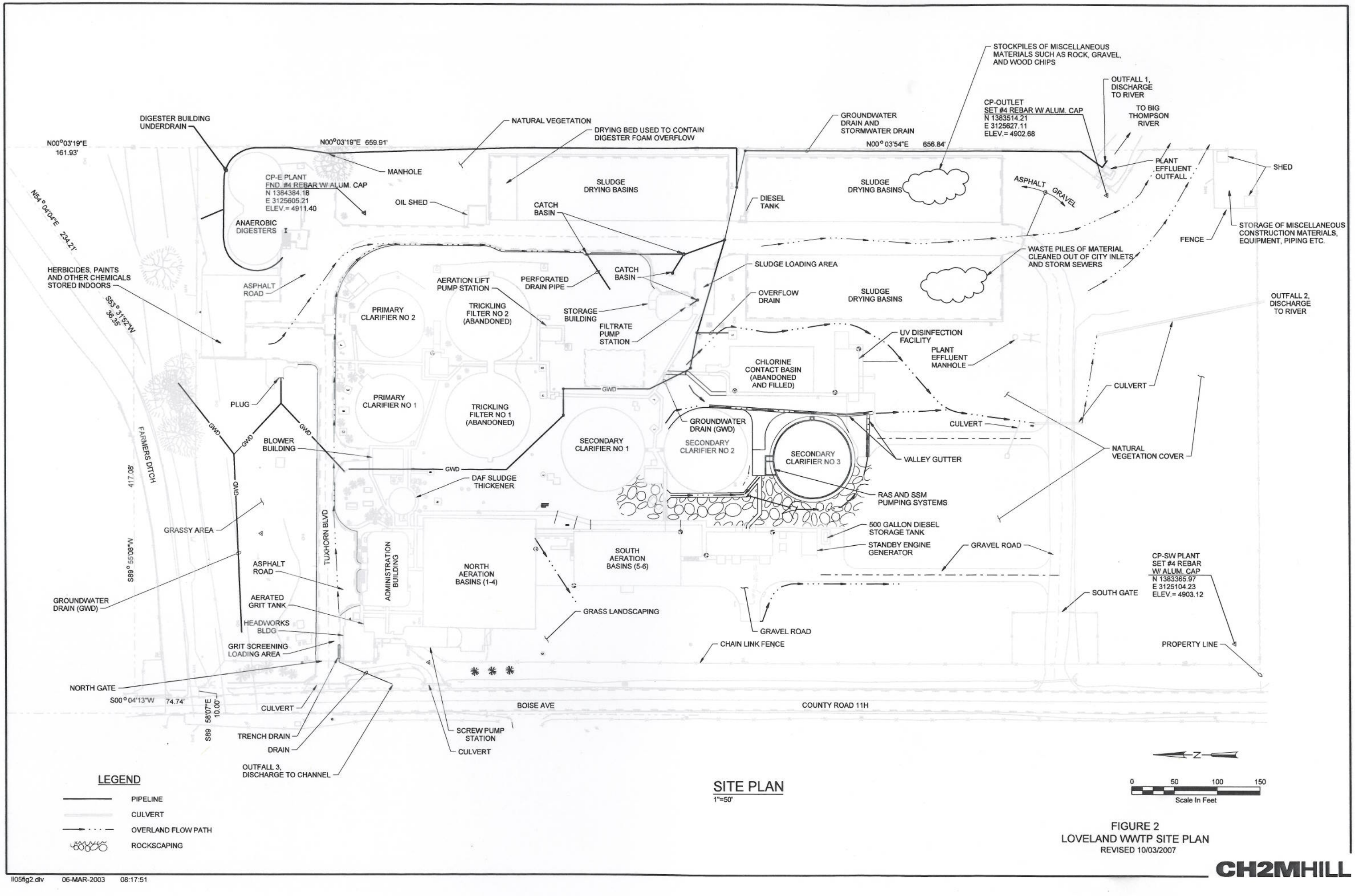


FIGURE 1
VICINITY MAP

CH2MHILL



SITE PLAN
1"=50'

FIGURE 2
LOVELAND WWTP SITE PLAN
REVISED 10/03/2007

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3.0 Potential Pollutants, Outfalls, and Monitoring

3.1 Outfalls and Potential Pollutants

3.1.1 Outfalls

There aretwo storm water outfalls from the Loveland WWTP site. They are discussed in Table 3-1. Storm water from outfalls 1 and 2 enters the Big Thompson River.

TABLE 3-1
Storm Water Outfalls at the Loveland WWTP

Outfall	Description	Potential Pollutant Sources	Potential Pollutants
001	Groundwater drain that drains the central area of the plant. This also includes run off from the paved areas around the north side of headworks building, main plant entrance, administration building, solids holding tanks, garage building, digester building, oil shed, and several of the abandoned sludge drying beds.	Any release from loading and unloading activities of wastes from screening, wastes from dumpster, sludge for land application, and lubricating oils. Sludge foam that may over flow the digester treatment units. Wash water from vehicle washing and washing down the maintenance area and sludge loading area.	TSS, CBOD, oil and grease, ammonia, fecal coliform, nitrates, sulfate, organic pollutants, solvents and floatables.
002	Drains mostly grassy areas on the south side of the plant as well as channelized areas. This includes run off from around the aeration basins, trickling filter no. 1, secondary clarifiers, and chlorine contact basin.	Sewage that may be released through a pipe break. Herbicides applied to the grassy areas and sediment from areas not vegetated or paved.	TSS, CBOD, ammonia, fecal coliform, nitrates, chlorine, sulfate, and organic pollutants.

3.1.2 Significant Dust or Particulate Generating Processes

A site evaluation of the facility and operations being performed at the facility confirmed there are not any processes that produce significant dust or particulate pollutants that could be released into the air or contaminate surface water.

3.1.3 Onsite Waste Disposal Practices

Based on a site evaluation of the facility, there are not any waste materials that are disposed of onsite.

3.1.4 Sara Title 313

The Loveland WWTP is subject to Section 313 of the Federal Emergency Planning and Community Right to Know requirements (title III of the Superfund Amendments and Reauthorization Act of 1986). As of November 2004,the WWTP no longer uses chlorine gas onsite, which is considered a hazardous substance and is subject to reportable quantity spill requirements. The UV disinfection Facility replaced the Chlorine Disinfection Facility. All products or materials containing 313 water priority pollutants are stored indoors and are not considered potential pollutant sources. See Appendix B for a list of the substances stored on-site.

3.1.5 Significant Spills or Leaks of Toxic or Hazardous Substances

At the time of SWMP preparation, there have not been any significant spills or leaks of toxic or hazardous substances at the facility within the past three years. The anaerobic digesters have occasionally overflowed the treatment units. These spills have occurred approximately once per year and were contained on the facility. Spill material was disposed of offsite.

3.2 Monitoring

3.2.1 Monitoring Stations

ROUTINE PERIODIC MONITORING OF STORM WATER IS NOT REQUIRED UNLESS REQUESTED BY THE CDPHE.

Sampling of stormwater may be required by the CDPHE-WQCD on a case-by-case basis, such as in the event that there is reason to suspect noncompliance with the Stormwater Management Plan or to measure the effectiveness of the BMPs in removing pollutants in the effluent.

If sampling is required, the permit requires that the results be reported to the CDPHE-WQCD on an annual basis along with the Annual Report, unless otherwise specified by the CDPHE-WQCD. Results shall be reported on CDPHE-approved discharge monitoring report forms.

If requested, stormwater sampling will involve obtaining a grab sample from each outfall and checking the sample for characteristics of color, odors, turbidity, hydrocarbon sheen, and other indications of pollution. If any pollution problems are noted from the sampling results, an investigation and identification of the source and cause of the pollution will be performed and appropriate corrective actions will be taken.

3.2.2 Sampling Protocols

The following sampling procedures will be used should the CDPHE-WQCD request sample collection, unless they request a different procedure. The CDPHE-WQCD will specify the parameters to be monitored.

1. Storm water outfall samples will be collected from discharges resulting from a rainfall event that is greater than 0.1 inch in magnitude and occurs at least 72 hours after any previous storm events that are 0.1 inch or greater. Composite samples will be obtained except as noted in item 2.

2. Grab samples will be used for monitoring for the following parameters:

   - pH
   - Temperature
   - Cyanide
   - Total Phenols
   - Residual Chlorine
   - Oil And Grease
   - Fecal Coliform
   - Fecal Streptococcus

3. Composite samples will be used to monitor for any other parameters. Composite samples will be taken in accordance with Colorado Discharge Permit System Regulations (Regulation No. 61). If discrete composite sampling is done, at least three separate aliquots will be taken in each hour of discharge for the entire discharge or for the first three hours of the discharge, with each aliquot being separated by a minimum period of fifteen minutes.

4. Quantitative data must be reported for the grab sample taken during the first thirty minutes of the discharge for all pollutants specified in Regulation 61.4(3)(b)(i).

5. Sample analysis will conform to the approved methods in 40 CFR Part 136.

6. The following information will be collected for each storm event unless otherwise directed by the CDPHE-WQCD:

   a. Date, duration, start and ending times and magnitude in inches of the storm event sampled.

   b. The total volume of the storm water discharges. This can be calculated by multiplying the magnitude of the storm, times the area drained times the runoff coefficient.

   c. The duration between the storm event samples and the end of the previous measurable (greater than 0.1 inch) rainfall.

7. Each monitoring point will provide a representative sample of the storm water being discharged. Flow will be measured at each stormwater outfall. Rather than sampling all outfalls it is possible to sample a single representative outfall. This determination will be made a the time that sampling is requested.

4.0 Pollutant Control Strategy

4.1 Source Specific Controls

In the previous section, Table 3-1 provided a list of potential pollutants that could be found at the Loveland WWTP. Table 4-1 lists the potential sources of pollutants and the controls or best management practices (BMPs) in place to prevent their entering the storm water.

TABLE 4-1
Sources of Pollutants and BMPs at the Loveland WWTP

Source	Location	Outfall	Pollutant Minimization/ BMPs
Sludge	Anaerobic Digesters	001	The anaerobic digesters have, in the past, overflowed the treatment units due to upsets in the treatment process. When this has occurred, typically foamy materials overflows and runs down the driveway. Plant operators can anticipate when this is going to happen and control the incident by installing an earthen berm to divert the digester flow into the first drying bed where the foamy material is contained. Unless contained, the foamy material could run down the street and enter into a storm sewer inlet, which discharges to the outfall channel and then into the Big Thompson River.
Raw or partially treated wastewater	Throughout plant	001 & 002	Wastewater is conveyed between facilities through underground pipelines that would not result in the contamination of stormwater. The potential sites for discharge would be at above ground connections to treatment units.
Diesel Storage Tank - Standby Electric Generator	South of Blower Building	002	A standby electrical generator and 500 gallon diesel storage tank was installed in 2004.The diesel storage tank is furnished with double wall construction and leak sensors between the inner and out wall Leaks are signaled to the plant SCADA system. Care is used by fueling contractor to avoid spills while transferring diesel fuel.
Temporary Diesel fuel station	Near Chlorine Building	001	Currently, the plant has a 500-gallon diesel fuel tank with secondary containment. This is going to be removed from the plant and fueling activities will be performed offsite at a commercial site.
Vehicle washing	Maintenance Shop	001	Currently, vehicles are washed near the Maintenance Shop, but this practice will no longer be performed outdoors. All washing will be performed either indoors where floor drains are connected to the sanitary sewer or offsite at a commercial site or at the City's Service Center.
Screenings from Headworks	Headworks Building	001 &	The auger screenings from the Headworks are disposed of in dumpsters kept indoors. City's solid waste department picks up the screenings approximately once per week. This is performed inside the Headworks Building. During this loading activity special care will be provided to ensure materials spilled are cleaned up and do not get discharged into the storm drain .

TABLE 4-1
Sources of Pollutants and BMPs at the Loveland WWTP

Source	Location	Outfall	Pollutant Minimization/ BMPs
Grit from Headworks	Headworks Building	001 &	Grit is removed from the Headworks Building approximately once a week. Loading activities are performed indoors where floor drains are connected to the treatment works inlet channel. During this loading activity special care will be provided to ensure materials spilled are cleaned up and do not get discharged into the storm drain.
Lubricating oils	Oil Shed	001	Lubricating oils for maintaining equipment and the treatment facility are stored inside a shed on the east side of the site. This shed is located in the flow path of stormwater when larger storm events occur. A berm has been installed to prevent stormwater from flooding the shed. Any spills inside the shed are cleaned up immediately using absorbent blankets or floor dry (kitty litter). To prevent leaky valves on the drums from causing oil stains on the concrete floor of the shed, spill pallets should be used to store drums of oil used on a regular basis.
Herbicides	Grassy Areas and Maintenance Shop	002	Small quantities of herbicides and insecticides are stored indoors in a locked cabinet. Herbicides stored onsite are applied by a trained applicator and are generally used only for spot weeding. The Parks Department will apply herbicides on the larger grassy areas. Herbicides will not be applied prior to forecasted storm events.
Paints, solvents and other miscellaneous materials	Maintenance Shop	001	Paint, solvents, degreasers, lubricants and miscellaneous cleaners are stored indoors in cabinets. These materials are used for building maintenance activities.
Miscellaneous Storage Area	Southeast corner of property near outfall	Overland Flow	This storage are contains miscellaneous construction materials, used valves, pipes, old equipment, etc. Some of these materials are greasy or have engine parts that may not be drained of all liquids. This storage area will be cleaned out on a regular basis and any materials that may contain liquids will be drained prior to storage.
Stockpiled Materials	Sludge Drying Basins	Overland Flow	Stockpiles of gravel, rock and wood chips are stored in the sludge drying beds, which are no longer being used for sludge treatment. These beds are depressed with a sloping entrance and containment walls on three sides. Materials stored in the drying beds will not contaminate stormwater. During loading and unloading activities care shall be taken to ensure all the material is within the depressed area of the beds and any material spilled is cleaned up afterward.
Waste piles of material cleaned out of City inlets	Sludge Drying Basins	Overland Flow	Piles of waste material cleaned out of City inlets and storm sewers are temporarily stored at the Plant before being taken to landfill. This material is stored inside the drying beds where it will not contaminate stormwater. During loading and unloading activities care shall be taken to ensure all the material is within the depressed area of the beds and any material spilled is cleaned up afterward.

4.2 Facility Wide Control Strategy

The following measures are those that are implemented on the site as a whole.

4.2.1 Good Housekeeping Measures and Controls

Good housekeeping practices help to maintain a clean and orderly work environment. At this facility, the following types of good housekeeping measures help to prevent pollutants from entering storm water discharges.

Operation and Maintenance

- Floors and ground surfaces are kept clean and dry using brooms or shovels.
- Curbs are cleaned out every couple of months.
- Paved areas are swept by the City street sweeper twice per year or on an as needed basis.
- The digested solids loading area is sprayed down every couple of days. Care is taken to ensure water from cleaning this area is directed toward the inlet drain that is connected to the filtrate pump station and not stormwater inlets.
- Garbage and waste materials are regularly picked up and properly disposed of.
- All spillage is promptly removed. Where it is impractical to constantly remove spillage, it is contained in the immediate area.
- Equipment is routinely inspected to make sure it is in working order.
- The importance of spill cleanup procedures is communicated to employees using signs.

Material Storage Practices

- Adequate aisle space is provided to facilitate material transfer and easy access for inspections.
- Containers, drums, and bags of material are stored away from direct traffic routes to prevent accidental spills.
- Where appropriate containers are stored on spill pallets to capture small spills or leaks.
- Containers are stacked according to manufacturers instructions.

Material Inventory Procedures

- Containers are labeled with the name of the material, expiration date, and health hazards.
- Inventory of all materials located at the facility is updated once per year.
- Storage areas with toxic or hazardous materials have been specially designed to contain spills.

4.2.2 Preventive Maintenance and Inspections

The facility's preventive maintenance and inspection program includes:

- Regular inspection and testing of the facility's storm water control systems to uncover conditions that could result in breakdowns or failures that could result in discharges of pollutants to surface waters. The inspections and testing is performed by City staff.
- Roadside ditches outside the facility's entrance are maintained to prevent runoff from flowing onto the facility.
- Proper maintenance of storm water control systems.
- The City performs maintenance of equipment as specified by the equipment manufacturers. The City's service technicians perform routine rounds to check equipment, oil levels and to perform repairs twice a week or on an as needed basis. Tracking of maintenance requirements and completed maintenance activities is achieved through a computer software scheduling program.

4.2.3 Employee Participation

- Information on good housekeeping practices is distributed to employees using signs, bulletin boards, and training or staff meetings when possible.
- Good housekeeping measures are discussed at employee meetings, as appropriate.
- Good housekeeping tips and reminders are posted at employee gathering areas.

4.2.4 Erosion and Sediment Controls

Most of the facility is either paved, landscaped or has natural vegetation. There is one area where natural vegetation has not produced significant ground cover and there is some bare soil. This area has been seeded in the past without success. Runoff from this area enters a culvert and discharges into a vegetated area before entering another culvert and discharging outside the facility property. Sediment from the culverts will be removed on an as needed basis.

4.2.5 Identification of Discharges other than Stormwater

The facility's storm sewer system is interconnected with a groundwater drain system. Therefore, discharges from outfall 001 include both stormwater and groundwater. Groundwater discharges from outfall 001 occur frequently and are not subject to storm or precipitation events. Based on a visual observation of the facility, there not any other non-stormwater discharges.

5.0 Spill Prevention and Response Practices

Loveland WWTP personnel will take appropriate measures to prevent spills and to prevent any spills that might occur from impacting waters of the State. This includes taking preventive measures around inlets in the immediate vicinity of fueling and liquid chemical transfer areas so as to prevent the ready release of spilled fuel or liquid chemicals via storm drains.

5.1 Procedures

IN THE CASE OF AN EMERGENCY TAKE MEASURES TO FIRST PROTECT HUMAN LIFE AND SAFETY. IN THE CASE OF A FIRE CALL 911, MEASURES SHOULD BE TAKEN TO PUT OUT THE FIRE FIST. THE CONTROL OF SPILLS IS SECONDARY.

When a spill is discovered, the employee discovering the spill must immediately stop the source of the spill and commence containment of the spill in as small an area as possible. The employee will immediately report the spill to the WWTP Plant Manager. The Plant Manager will dispatch additional personnel or equipment as required to assist in the containment of the spill. The Plant Manager will provide any required notifications to government agencies and recommend options for cleanup, storage, and disposal of spill residue. The Plant Manager will be responsible for logging the event on the "Spill Report Form." (Appendix C). The following items list the appropriate measures to be taken for each type of spill.

Leaks, Seeps, and Other Non-Flowing Releases of Non-Flammable Products

1. Take actions and/or confirm that containment is provided by checking the position of valves, placement of sandbags, absorbent booms, etc. and other devices that provide containment.
2. Notify the Plant Manager of the spill location and status. Note actions taken under Step 1 above.

Leaks, Seeps, and Other Non-Flowing Releases of Flammable Products

1. Call for assistance from other personnel
2. Terminate possible ignition sources such motors, vehicles, etc.
3. Post qualified personnel at a safe location to warn others and prevent ignition.
4. Take actions and/or confirm that containment is provided by checking the position of valves, placement of sandbags, etc and other devices that provide containment.
5. Notify the Plant Manager of the spill location and status. Note actions taken under Steps 1 through 4 above.

Flowing Releases of Non-Flammable Products

1. Call for assistance from other personnel. Terminate source.
2. Take actions and/or confirm that containment is provided by checking the position of valves, placement of sandbags, etc. and other devices that provide containment.
3. Notify the Plant Manager of the spill location and status. Note actions taken under Steps 1 and 2 above.

Flowing Release of Flammable Products

1. Call for assistance from all personnel in immediate area; warn other personnel, including those off-site, that they may be in immediate danger. Call 911 City of Loveland Fire Department HAZMAT Response.
2. Terminate source and any ignition source such as motors, vehicles, etc.
3. Post qualified personnel at a safe location to warn others and prevent ignition.
4. Notify the Plant Manager of the spill location and status. Note actions taken under Steps 1 through 3 above. If manager is not available, call the Fire Department immediately.
5. Take actions and/or confirm that containment is provided by checking the position of valves, placement of sandbags, etc.

5.2 Notification

Notification to the CDPHE is required if there is any release or suspected release of any substance, including oil or hazardous substances, that spills into or threaten state waters. Unless otherwise noted notifications are to be made by the Plant Manager and only after emergency responses related to the release have been implemented. This will prevent misinformation and assures that notifications are properly conducted.

The notification requirements are as follows:

1. **Spill into/or Threatens State Waters:** Immediate notification is required for releases that occur beneath the surface of the land or impact or threaten waters of the state or threaten the public health and welfare. Notifications that will be made are:
   a. For any substance, regardless of quantity, contact CDPHE at 1-877-518-5608. State as follows:
      (a) Give your name and inform them that you are calling for the City of Loveland, Colorado, WWTP.
      (b) Give location of spill (name of city and state).
      (c) Describe nature of spill, type of product, and estimate size of spill.
      (d) Describe type of action taken thus far, type of assistance or equipment needed.
   b. For any quantity of oil or hazardous substances, call the National Response Center at 1-800-424-8802. State as follows:

(a) Give your name and inform them that you are calling for the City of Loveland, Colorado, WWTP.

(b) Give location of spill (name of city and state).

(c) Describe nature of spill, type of product, and estimate size of spill.

(d) Describe type of action taken thus far, type of assistance or equipment needed.

2. **Reportable Quantity Spill on Land Surface:** Immediate notification is required of a release upon the land surface of an oil in a quantity that exceeds 25 gallons, or of a hazardous substance that equals or exceeds 10 pounds or its reportable quantity under Section 101(14) of the Comprehensive Environmental Response, compensation and Liability Act of 1980 as amended (40 CFR Part 302) and Section 329(3) of the Emergency Planning and Community Right to Know Act of 1986 (40 CFR Part 355) whichever is less. Appendix D lists the substances and their reportable quality. This requirement does apply at a minimum to the substances listed in Table 5-1.

TABLE 5-1
Substances Requiring Notification

Substance	Reportable Quantity
Sodium Hypochlorite (Chlorite)	100 lbs.
Diesel Fuel	25 Gallons

The procedures to be followed are as follows:

a. Call the National Response Center at 1-800-424-8802. State as follows:

(a) Give your name and inform them that you are calling for the City of Loveland, Colorado, WWTP.

(b) Give location of spill (name of city and state).

(c) Describe nature of spill, type of product, and estimate size of spill.

(d) Describe type of action taken thus far, type of assistance or equipment needed.

3. Notification is not required for release of oil upon the land surface of 25 gallons or less that will not constitute a threat to public health and welfare, the environment or a threat of entering the waters of the state.

4. Notification, as required in paragraphs 1 and 2 above, will be made to the CDPHE using the 24 hours a day telephone number to report environmental spills. All information known about the release at the time of discovery is to be included, such as the time of

occurrence, quantity and type of material, location and any corrective or clean up actions presently being taken. Table 5-2 lists these phone numbers.

TABLE 5-2
Emergency Notification Contacts

Name	Position	Number
Mr. Michael McCrary	Lead Operator	(970) 962-2572
Mr. Johnny Tuxhorn	Treatment Manager	(970) 962-2570
Mr. Stephen Adams	Water Utility Manager	(970) 962-3559
Mrs. Tracy Turner-Naranjo	Loveland Risk Management	(970) 962-2323
	Loveland Fire Department	911
	Loveland Police	911
	Ambulance	911
	Hospital	911
	National Response Center	1-800-424-8802
	CDPHE – Report Environmental Spills (24 hrs/day)	1-877-518-5608
	Colorado Emergency Planning Committee	303-273-1622
	State Police	911
Stewart Environmental Mr. Thomas Norman	Vice President	(970) 226-5500
RMCAT	Emergency Response	(800) 930-0011

5.3 Reports

The CDPHE requires written notification of a spill or discharge of oil or other substance that may cause pollution of the waters of the state. A written report must be submitted to the WQCD within five days after becoming aware of the spill or discharge.

The CDPHE requires a written final report within 15 days for all releases of an oil or hazardous substance that require implementation of a contingency plan. The CDPHE may also require additional reports on the status of the clean up until any required remedial action has been complete.

Written notifications or reports must contain at a minimum:

1. Date, time and duration of the release.

2. Location of the release.
3. Person or persons causing and responsible for the release.
4. Type and amount of oil or hazardous substance released.
5. Cause of the release.
6. Environmental damage caused by the release.
7. Actions taken to respond, contain, and clean up the release.
8. Location and method of ultimate disposal of the oil and hazardous substance and other contaminate materials.
9. Actions taken to prevent a reoccurrence of the release.
10. Any known or anticipated acute or chronic health risks associate with the release.
11. When appropriate advice regarding medical attention necessary for exposed individuals.

5.4 Actions to be taken by the WWTP

The following actions will be taken by the WWTP as appropriate for a spill.

1. **Containment:** Wherever an oil or hazardous substance is released, it is the duty of the Plant Manager to take or cause to be taken, within 24 hours, all necessary steps to stop the release and contain all released material. As soon as the release has been stopped and contained the Plant Manager will ensure that action is taken to preclude a continued or future release. Notify the City's Risk Management Department of a spill. The City has a Contract with an Emergency Responsder for Spill Containment and Cleanup. The Loveland Fire Hazmat Team, Risk Management , or Plant Manager may initiate action from Emergency Responder.
2. **Investigation:** When a release occurs, the responsible person shall determine all of the affected environment and provide other pertinent information deemed necessary for the CDPHE to fully assess the impacts of the release including, but not limited to, the names and addresses of adjacent landowners and existing water users. The release investigation will be conducted in a timely and diligent manner and in accordance with a schedule established by CDPHE.
3. **Remedial Action:** The WWTP will develop a written remedial action plan if requested by CDPHE. Once developed, the plan will be sent to CDPHE for its written approval.
4. **Disposal:** Wastes generated from the clean up of an oil or hazardous substance release will be disposed of in accordance with state and federal regulations. Other waste will be disposed of as determined by the CDPHE. Approval of CDPHE will be obtained prior to any disposal action.

6. Employee Training

Employee training is provided to inform employees of the components and goals of the SWMP. New employees receive initial training in storm water pollution prevention and good housekeeping techniques prior to beginning their work assignment. Thereafter, training is provided on the job and during training sessions once a year.

The SWMP training addresses three major areas:

- Spill prevention and response
- Good housekeeping
- Materials management practices

Appendix D includes documentation of training.

7. Facility Inspections

Twice a year, once in the spring and once in the fall, City staff will conduct an inspection to:

- Confirm the accuracy of the description of potential pollutant sources contained in the SWMP.
- Determine the effectiveness of the Plan.
- Assess compliance with the terms and conditions of the storm water permit.

During the evaluation, material handling and storage areas, loading and unloading areas, process areas and other potential sources of pollution will be visually inspected for evidence of actual or potential pollutant discharges to the drainage system. Structural stormwater management measures, sediment and control measures, and other structural pollution prevention measures shall be inspected to ensure they are operating correctly. A review of the SWMP will be performed to determine if any changes to the plan are necessary.

The results of each inspection are recorded on the Semi – Annual Site Inspection Report form. The report describes:

- Who conducted the inspection,
- When the inspection was conducted,
- Scope of the inspection,
- Findings of the inspection,
- Any corrective actions taken, and
- When corrective actions were implemented.

The inspection report(s) are retained at the facility for at least 3 years after the date that the NPDES storm water permit expires. Completed inspection report forms will be provided in Appendix E of the SWMP.

Based on the results of each inspection, the list of potential pollutant sources and the measures and controls described in this Plan are to be revised (if appropriate) within 2 weeks of the inspection. Any changes to the SWMP as a result of the inspection shall be implemented in a timely manner, but in no case more than 90 days after the inspection.

8. SWMP Reviews and Updates

The SWMP will be reviewed annually by City staff to ensure it is effective in minimizing the discharge of pollutants. The SWMP will be updated by City staff, if necessary.

The SWMP will be updated and the necessary changes made and implemented within 90 days, unless the CDPHE provides an extension. This update will occur if:

- Any SWMP review indicates changes are needed.
- The recognition of any deficiencies or needed changes is discovered as a result of a facility inspection.
- Any changes occur at the facility that require the SWMP to be modified.

Records of the following information will be maintained for a period of at least three years relative to SWMP reviews and changes,

- Who conducted the review,
- Findings of the review, and
- Any changes made to the SWMP.

Amendments to the SWMP shall be summarized in the next Annual Report to be submitted to CDPHE-WQCD.

8.1 CDPHE-WQCD Review of SWMP

The WQCD may request, at any time, to review the SWMP and may require modifications to the plan if it does not meet one or more minimum requirements of the CDPS General permit. If notified that the SWMP is inadequate, changes must be made to the plan, implemented at the facility, and the plan resubmitted to the WQCD within 30 days after such notification.

9. Record Keeping and Reporting

9.1 Record Keeping

The CDPS General permit requires documentation of spills, inspections, maintenance, and monitoring (if appropriate) to be maintained onsite with the SWMP for a period of at least three years after the expiration of permit.

9.1.1 Spills

A record-keeping system has been set up at the facility for documenting spills, leaks, and other discharges, including discharges of hazardous substances in reportable quantities. The records contain the following information:

- Date and time of the incident,
- Duration of the spill/leak/discharge,
- Cause of the spill/leak/discharge,
- Response procedures implemented,
- Persons notified, and
- Environmental problems associated with the spill/leak/discharge.

Records of spills and leaks will be attached in Appendix F of the SWMP.

9.1.2 Inspections

A separate record-keeping system has been established to document inspection and maintenance activities. Results of each inspection are recorded on the Semi-Annual Site Inspection Report form and completed forms are attached in Appendix E of the SWMP.

9.1.3 Monitoring

Records of any monitoring required by the CDPHE are retained in the SWMP in Appendix G for at least 3 years after the monitoring date or the expiration of the permit, whichever is longer.

9.2 Reporting

9.2.1 Annual Report

An Annual Report detailing the facility's compliance with the SWMP will be submitted to the WQCD before February 15 of each year. The Annual Report will cover activities occurring between January 1 through December 31, of the previous year, and will contain , at minimum:

1. Name of the facility, address, phone number and permit certification number.
2. A report of the facility's overall compliance with the SWMP.

3. A summary of each comprehensive stormwater facility inspection made, including date, findings, and actions taken.
4. Results and interpretation of any stormwater monitoring performed.
5. The report shall be signed and certified for accuracy by the Water and Power Department's Water Utilities Manager..

The Annual Report will be submitted to the following address:

Colorado Department of Public Health and Environment
Water Quality Control Division
WQCD-P-B2
4300 Cherry Creek Drive South
Denver, CO 80246-1530

9.2.2 Other Reporting

The WWTP staff must report instances of non-compliance such as:

1. Failure to implement a SWMP compliance schedule requirement.
2. Failure to carryout any requirement of the permit, such as failure to conduct inspections or failure to revise the SWMP as required or failure to certify the SWMP.
3. Stormwater discharges that:
   a. Are not free from toxic substances, alone or in combination with other substances, which create conditions unsuitable for aquatic life, such as a fish kill.
   b. Contain pollutants at concentrations or levels that produce objectionable films, colors, turbidity, deposits or noxious odors in the receiving stream or waterway.

Appendix A, Permit for Stormwater Discharges Associated with Light Industrial Activity

STATE OF COLORADO

Bill Owens, Governor
Dennis E. Ellis, Executive Director

Dedicated to protecting and improving the health and environment of the people of Colorado

4300 Cherry Creek Dr. S.
Denver, Colorado 80246-1530
Phone (303) 692-2000
TDD Line (303) 691-7700
Located in Glendale, Colorado

http://www.cdphe.state.co.us

Laboratory Services Division
8100 Lowry Blvd.
Denver, Colorado 80230-6928
(303) 692-3090

Colorado Department
of Public Health
and Environment

CITY OF LOVELAND, CO
JUN 2006
Water & Power

June 15, 2006

Stephen C. Adams, Water Utility Mgr
Loveland, City of, WWTP
200 N. Wilson Avenue
Loveland, CO 80537
970/962-3400

RE: Final Permit, Colorado Discharge Permit System - Stormwater
Certification No. : **COR-011125**
Loveland, City of - Loveland WWTP
Larimer County

Local Contact: Johnny Tuxhorn, Water Treatment Mgr
970/ 962-2570

Dear Sir or Madam:

Enclosed please find a copy of the new permit and certification which have been re-issued to you under the Colorado Water Quality Control Act.

Your old permit expires on June 30, 2006. This is a renewal to the permit, and replaces the old one. See page 1 of the Rationale (the pages in italics) for a summary of the minor changes to the permit.

Your certification under the permit requires that specific actions be performed at designated times. You are legally obligated to comply with all terms and conditions of the permit.

Please read the permit and certification. If you have any questions, contact the Matt Czahor at (303) 692-3575 or Nathan Moore at (303) 692-3555.

Sincerely,

Kathryn Dolan
Stormwater Program Coordinator
Permits Section
Water Quality Control Division

CERTIFICATION

CDPS GENERAL PERMIT

STORMWATER DISCHARGES ASSOCIATED WITH

LIGHT INDUSTRY

Industrial Activity: WWTP.

Primary SIC code: 4952

This permit specifically authorizes: **Loveland, City of, WWTP**

to discharge stormwater from the facility identified as: Loveland WWTP

which is located at: 920 South Boise Avenue
Loveland, CO 80537

in: Larimer County

to: Big Thompson River

effective: 7/1/2006

Annual Fee: $232.00 (**DO NOT PAY NOW**. You will receive a bill later.)

Next Annual Report Due: 02/15/07

CDPS GENERAL PERMIT

STORMWATER DISCHARGES ASSOCIATED WITH
LIGHT INDUSTRIAL ACTIVITY

AUTHORIZATION TO DISCHARGE UNDER THE

COLORADO DISCHARGE PERMIT SYSTEM

In compliance with the provisions of the Colorado Water Quality Control Act, (25-8-101 et seq., CRS, 1973 as amended) and the Federal Water Pollution Control Act, as amended (33 U.S.C. 1251 et seq.; the "Act"), this permit authorizes the discharge of stormwater associated with light industrial activity certified under this permit, from those locations specified throughout the State of Colorado to specified waters of the State. Such discharges shall be in accordance with the conditions of this permit.

This permit specifically authorizes the facility listed on page 1 of this permit to discharge stormwater associated with light industrial activity, as of this date, in accordance with the permit requirements and conditions set forth in Parts I and II hereof. All discharges authorized herein shall be consistent with the terms and conditions of this permit.

This permit and the authorization to discharge shall expire at midnight, **June 30, 2011**.

Issued and Signed this 31st day of May, 2006.

COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT

Janet S. Kieler
Permits Section Manager
Water Quality Control Division

ISSUED AND SIGNED MAY 31, 2006

EFFECTIVE JULY 1, 2006

CDPS GENERAL PERMIT - LIGHT INDUSTRY

TABLE OF CONTENTS

PART I

PART I

A. COVERAGE UNDER THIS PERMIT

1. Authority to Discharge

Under this general permit, facilities engaged in light industrial activity as listed in Part I.A.5 are granted authorization to discharge stormwater associated with industrial activity into waters of the state of Colorado.

2. Application, Due Dates

a. **Application Due Dates:** At least **thirty days** prior to the anticipated date of discharge, the owner (or operator if the owner does not operate the facility) of the facility shall submit an application as provided by the Division.

One original of the completed permit application form shall be submitted to:

Colorado Department of Public Health and Environment
Water Quality Control Division
WQCD-P-B2
4300 Cherry Creek Drive South
Denver, Colorado 80246-1530

b. **Application Form:** The application form requires, at a minimum, the following information:

1) Name and address of principal in charge of operation of the facility;
2) Site address and location;
3) Facility contact person, phone number and email address (if available);
4) Standard Industrial Classification (SIC) code(s);
5) List of other environmental permits currently held by the facility;
6) Facility description/industrial activities which take place at the site;
7) Receiving waters; and
8) Certification as to the completion of a Stormwater Management Plan (SWMP).

3. Permit Certification Procedures

If the general permit is applicable, then a certification will be developed and the applicant will be certified under this general permit.

a. **Request for Additional Information:** The Division shall have up to **thirty days** after receipt of the above information to request additional data and/or deny the authorization for any particular discharge. Upon receipt of additional information, the Division shall have an additional **fifteen days** to issue or deny authorization for the particular discharge. (Notification of denial shall be by letter, in cases where coverage under an alternate general permit or an individual permit is required, instead of coverage under this general permit.)

b. **Automatic Coverage:** If the applicant does not receive a request for additional information or a notification of denial from the Division dated within thirty days of the receipt of the application by the Division, authorization to discharge in accordance with the conditions of this permit shall be deemed granted.

c. **Individual Permit Required:** If, after evaluation of the application (or additional information, such as the SWMP), it is found that this general permit is not applicable to the operation, then the application will be processed as one for an individual permit. The applicant will be notified of the Division's decision to deny certification under this general permit. For an individual permit, additional information may be requested, and 180 days will be required to process the application and issue the permit. Temporary coverage under this general permit may be allowed until the individual permit goes into effect.

A. COVERAGE UNDER THIS PERMIT (cont.)

pursuant to section 313 of SARA III; fertilizers; pesticides; and waste products such as ashes, slag and sludge that have the potential to be released with stormwater discharge.

6. **Individual Permit Criteria**

Various criteria can be used in evaluating whether or not an individual (or alternate general) permit is required instead of this general permit. This information may come from the application, SWMP, or additional information as requested by the Division, and includes, but is not limited to, the following:

a. the quality of the receiving waters (e.g., the presence of downstream drinking water intakes or a high quality fishery, or for preservation of high quality water);
b. the type of industry, including pollution potential;
c. the volume and type of materials handled;
d. the size of the facility;
e. evidence of noncompliance under a previous permit for the operation;
f. the use of chemicals within the stormwater system; or
g. discharges of pollutants of concern to waters for which there is a Total Maximum Daily Load (TMDL) established.

In addition, an individual permit may be required when the Division has shown or has reason to suspect that the stormwater discharge may contribute to a violation of a water quality standard.

7. **Mobile Asphalt and Concrete Batch Plants**

The Division has determined that, if adequately addressed by the facility's SWMP, the permit certification may be tied to the plant, as opposed to the site. The permittee's SWMP shall contain additional relevant information, such as the proposed standard Best Management Practices (BMPs) which would be used at each site, etc. The permittee must still meet the application, permit and SWMP requirements as described herein. **The permittee is required to summarize the current location and past locations of the plant for the previous year in the Annual Report.** See Part I.D.1 of the permit. As an alternative, a batch plant that is dedicated to a specific construction site may instead be covered under a CDPS Construction Stormwater general permit certification issued to that site, provided that the site's SWMP includes adequate provisions for the batch plant.

B. STORMWATER MANAGEMENT PLAN - CONTENTS AND REQUIREMENTS

A Stormwater Management Plan (SWMP) shall be developed for each facility covered by this permit. SWMPs shall include BMPs that are selected, installed, implemented and maintained in accordance with good engineering practices. (The plan need not be completed by a registered engineer.)

The plan shall identify potential sources of pollution which may reasonably be expected to affect the quality of stormwater discharges associated with industrial activity from the facility. In addition, the plan shall describe and ensure the implementation of practices which are to be used to reduce the pollutants in stormwater discharges associated with industrial activity at the facility and to assure compliance with the terms and conditions of this permit.

As a condition of this permit, facilities must implement the provisions of the SWMP required under this part. The Division reserves the right to review the plan, and to require additional measures to prevent and control pollution as needed.

Any SWMP prepared before June 30, 2006 that does not meet all of the requirements listed herein (especially those items required for the site map) must be amended to conform with the SWMP requirements in this permit. Such amendments must be completed within 60 days of the certification effective date (typically July 1, 2006).
The SWMP shall include the following items, at a minimum:

1. **Industrial Activity Description**

The plan shall provide a narrative description of the industrial activity taking place at the site.

B. STORMWATER MANAGEMENT PLAN - CONTENTS AND REQUIREMENTS (cont.)

3) Sediment and erosion prevention: The plan shall identify areas which, due to topography, activities, or other factors, have a high potential for significant soil erosion, and identify measures taken to limit erosion.

4) Other pollution prevention measures: The plan shall identify any other structural and non-structural measures for stormwater quality control on-site.

In each case where stormwater pollution potential exists, appropriate preventive measures must be taken and documented.

c. **Sampling Information:-** The plan shall include a summary of any existing discharge sampling data describing pollutants in stormwater discharges, and a description of each existing or proposed sampling point, if monitoring is required by the Division under Part I.D.2.

d. **Preventive Maintenance:** A preventive maintenance program is required, and shall involve inspection and maintenance of stormwater management devices (cleaning oil/water separators, catch basins, etc.) as well as inspecting and testing plant equipment and systems to uncover conditions that could cause breakdowns or failures resulting in discharges of pollutants to surface waters. These periodic inspections are different from the comprehensive site evaluation (see Part I.C.5), although the former may be incorporated into the latter. Equipment, area, or other inspections are typically visual and are normally conducted on a regular basis (e.g., daily inspections of loading areas).

e. **Good Housekeeping:** Good housekeeping requires the maintenance of a clean, orderly facility. This part of the SWMP shall address cleaning and maintenance schedules, trash collection and disposal practices, grounds maintenance, etc.

f. **Spill Prevention and Response Procedures:** Areas where potential spills can occur, and their accompanying drainage points, shall be identified clearly in the SWMP. Where appropriate, specifying material handling procedures and storage requirements in the plan shall be considered. Procedures for cleaning up spills shall be identified in the plan and made available to the appropriate personnel. The necessary equipment to implement a clean up shall be available to personnel.

g. **Employee Training:** Employee training programs shall inform personnel at all levels of responsibility (who are involved in industrial activities that may impact stormwater runoff) of the components and goals of the SWMP. Training shall address topics such as spill response, good housekeeping and material management practices. The SWMP shall identify periodic dates for such training. Contractor or temporary personnel shall be informed of plant operation and design features in order to prevent discharges or spills from occurring.

h. **Identification of Discharges other than Stormwater:** The stormwater conveyance system on the site shall be evaluated for the presence of discharges other than stormwater. The SWMP shall include a description of the results of any evaluation for the presence of discharges other than stormwater, the method used, the date of the evaluation, and the on-site drainage points that were directly observed during the evaluation.

A number of discharges other than stormwater may not require a CDPS Industrial Wastewater Discharge permit and are considered Allowable Non-Stormwater Discharges. Any of these discharges that exist at the site must be identified in the SWMP. See Part I.C.3.b of the permit for a list of such allowable discharges.

4. **Comprehensive Inspections**

The SWMP shall identify qualified personnel that shall inspect designated equipment and plant areas. The procedures and intervals of the comprehensive inspection shall also be specified in the plan and shall be consistent with Part I.C.5. Except as provided in paragraphs (d) and (e) of that part, comprehensive inspections shall in no case be completed less than twice a year (in the spring and fall). The operator shall keep a record of such inspections. This record shall be made available to the Division upon request and shall be summarized in the Annual Report.

C. OTHER TERMS AND CONDITIONS (cont.)

3. **Prohibition of Non-stormwater Discharges**

a. Except as provided in subsection b, below, **all discharges authorized by this permit shall be composed entirely of stormwater discharges associated with industrial activity**. Discharges of material other than stormwater must be addressed in a separate CDPS permit issued for that discharge.

b. Discharges from the following sources may be authorized by this permit, provided that:

1) appropriate control measures to minimize the impacts of such sources are implemented as needed; and
2) the non-stormwater component(s) of the discharge and the control measure(s) used are identified in the SWMP.

These sources include discharges from emergency fire fighting activities; fire hydrant flushing; potable water, including water line flushing; pavement wash waters where no detergents are used and no spills or leaks of toxic or hazardous materials have occurred (unless all spilled material has been removed); routine external building and sign washdown that does not use detergents; uncontaminated compressor condensate; irrigation drainage; lawn watering; air conditioner condensate; uncontaminated springs; foundation or footing drains where flows are not contaminated; and incidental windblown mist from cooling towers that collects on rooftops of adjacent portions of the facility, but NOT intentional discharges from the cooling tower.

4. **Releases in Excess of Reportable Quantities**

This permit does not relieve the permittee of the reporting requirements of 40 CFR 110, 40 CFR 117 or 40 CFR 302. Any discharge of hazardous substances must be handled in accordance with the Division's Notification Requirements (see Part II.A.3 of the permit).

5. **Comprehensive Facility Inspections**

In addition to the inspections necessary to comply with the preventive maintenance program requirements in Part I.B.3.d, qualified personnel identified by the permittee shall make a comprehensive inspection of their stormwater management system, at least twice per year (in the spring and fall), except as provided in paragraphs d and e, below. These comprehensive inspections must be documented and summarized in the Annual Report (see Part I.D.1 of the permit). Qualified personnel are those who possess the knowledge and skills to assess conditions and activities that could impact stormwater quality at the facility, and who can also evaluate the effectiveness of BMPs selected.

a. Material handling areas, disturbed areas, areas used for material storage that are exposed to precipitation, and other potential sources of pollution identified in the SWMP in accordance with Part I.B.3.b of this permit shall be inspected for evidence of, or the potential for, pollutants entering the drainage system. Structural stormwater management measures, sediment and control measures, and other structural pollution prevention measures identified in the plan shall be observed to ensure that they are operating correctly. A visual inspection of equipment needed to implement the plan, such as spill response equipment, shall be made to confirm that it is readily available and in proper working order.

b. Any repairs or maintenance needs identified by the inspection shall be completed immediately. Based on the results of the inspection, if revisions to the description of potential pollutant sources and pollution prevention measures identified in the plan are needed, the plan shall be revised as appropriate, and shall provide for implementation of any changes to the plan in a timely manner, and in compliance with the requirements of Part I.C.2.c.2.

c. A report summarizing the scope of the inspection, personnel making the inspection, the date(s) of the inspection, significant observations relating to the implementation of the SWMP, and actions taken in accordance with paragraph (b), above, shall be made and retained for at least three years after the date of the inspection. Significant observations include such things as the locations of discharges of pollutants from the site; locations of previously unidentified sources of pollutants; locations of BMPs needing maintenance or repair; locations of failed BMPs that need replacement; and locations where additional BMPs are needed. The report must also document any incidents of noncompliance observed.

D. MONITORING AND REPORTING (cont.)

f. For mobile asphalt and concrete batch plants, a description of the current location and past locations for the reporting year.

The Annual Report will be due to the Division on or before **February 15** of the following year (see address below). The exact due date for the permittee's first Annual Report will be listed in their certification. The first report may include less than twelve months of information, unless otherwise indicated in the certification. The Division reserves the right to require additional information in the report, on a case-by-case basis, as needed.

A signed copy of the above report form shall be submitted to the following address:

Colorado Department of Public Health and Environment
Water Quality Control Division
WQCD-P-B2
4300 Cherry Creek Drive South
Denver, Colorado 80246-1530

2. **Monitoring**

Sampling and testing of stormwater for specific parameters is not required on a routine basis under this permit. The Division reserves the right to require sampling and testing, on a case-by-case basis, in the event that there is reason to suspect that compliance with the SWMP is a problem, or to measure the effectiveness of the BMPs in removing pollutants in the effluent.

If monitoring is required, the following definitions apply:

a. The **thirty (30) day average** shall be determined by the arithmetic mean of all samples collected during a thirty (30) consecutive-day period.

b. A **grab** sample, for monitoring requirements, is a single "dip and take" sample.

3. **Reporting of Data**

Reporting of any monitoring data gathered in compliance with Part I.D.2 shall be on an annual basis, unless otherwise specified by the Division.

Monitoring results shall be summarized for each year (January 1-December 31) and reported on Division-approved discharge monitoring report forms and submitted to the Division with the Annual Report due **February 15** of each year at the address above.

4. **Reporting to Municipality**

Any permitted facility discharging to a municipal storm sewer shall provide the municipality with a copy of the permit application, and/or Annual Reports, upon request. A copy of the SWMP shall also be provided to the municipality upon request.

5. **Signatory Requirements**

a. All reports and applications submitted to the Division and/or EPA shall be signed and certified for accuracy by the permittee in accordance with the following criteria:

1) In the case of corporations, by a principal executive officer of at least the level of vice-president or his or her duly authorized representative, if such representative is responsible for the overall operation of the facility from which the discharge described in the form originates;
2) In the case of a partnership, by a general partner;
3) In the case of a sole proprietorship, by the proprietor;

E. GENERAL REQUIREMENTS (cont.)

2. **Record-keeping and Internal Reporting Procedures**

Incidents such as spills or other discharges, along with other information describing the quality and quantity of stormwater discharges, shall be included in the records. Inspections and maintenance activities shall be documented and recorded. The permittee shall retain such records for a minimum of three (3) years from the date generated. All reports required by the permit and/or the Division, and any relevant correspondence, shall be retained for a minimum of five (5) years from the date generated.

PART II

A. MANAGEMENT REQUIREMENTS

1. **Change in Discharge**

The permittee shall inform the Division (Permits Section) in writing of any intent to construct, install, or alter any process, facility, or activity that is likely to result in a new or altered discharge that is not composed entirely of stormwater and/or allowable non-stormwater discharges identified in Part I.C.3.b. Division notification is also required if the permittee significantly changes the industrial activities at the site such that the industrial activities are no longer consistent with the activity description and/or SIC Code(s) originally identified in the permit application. The permittee shall furnish the Division such plans and specifications which the Division deems reasonably necessary to evaluate the effect on the discharge and receiving stream. If applicable, this notification may be accomplished through submittal of an application for a CDPS process water permit authorizing the discharge. The SWMP shall be updated and implemented prior to the changes. Also see Part I.C.2.c.(2).

Any discharge to the waters of the State from a point source other than specifically authorized by this permit or a different CDPS permit is prohibited.

2. **Special Notifications - Definitions**

a. **Spill**: An unintentional release of solid or liquid material which may cause pollution of state waters.

b. **Upset**: An exceptional incident in which there is unintentional and temporary noncompliance with permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventative maintenance, or careless or improper operation.

3. **Noncompliance Notification**

a. If, for any reason, the permittee does not comply with or will be unable to comply with any discharge limitations, standards or permit requirements specified in this permit, except as addressed in sub-paragraph c. of this section, the permittee shall, at a minimum, provide the Water Quality Control Division and EPA with the following information:

1) A description of the discharge and cause of noncompliance;

2) The period of noncompliance, including exact dates and times and/or the anticipated time when the discharge will return to compliance; and

3) Steps being taken to reduce, eliminate, and prevent recurrence of the noncomplying discharge.

A. MANAGEMENT REQUIREMENTS (cont.)

8. **Minimization of Adverse Impact**

The permittee shall take all reasonable steps to minimize any adverse impact to waters of the State resulting from noncompliance with any terms and conditions specified in this permit, including such accelerated or additional monitoring as necessary to determine the nature and impact of the noncomplying discharge.

9. **Reduction, Loss, or Failure of Stormwater Controls**

The permittee has the duty to halt or reduce any activity if necessary to maintain compliance with the permit requirements. Upon reduction, loss, or failure of the stormwater control, the permittee shall, to the extent necessary to maintain compliance with its permit, control production, or remove all pollutant sources from exposure to stormwater, or both until the stormwater controls are restored or an alternative method of treatment/control is provided.

It shall not be a defense for a permittee in an enforcement action that it would be necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

10. **Proper Operation and Maintenance**

The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems only when necessary to achieve compliance with the conditions of the permit.

B. RESPONSIBILITIES

1. **Inspections and Right to Entry**

The permittee shall allow the Director of the State Water Quality Control Division, the EPA Regional Administrator, and/or their authorized representative(s), upon the presentation of credentials:

a. To enter upon the permittee's premises where a regulated facility or activity is located or in which any records are required to be kept under the terms and conditions of this permit;

b. At reasonable times to have access to and copy any records required to be kept under the terms and conditions of this permit and to inspect any monitoring equipment or monitoring method required in the permit; and

c. To enter upon the permittee's premises to investigate, within reason, any actual, suspected, or potential source of water pollution, or any violation of the Colorado Water Quality Control Act. The investigation may include, but is not limited to, the following: sampling of any discharge and/or process waters, the taking of photographs, interviewing permittee staff on alleged violations and other matters related to the permit, and access to any and all facilities or areas within the permittee's premises that may have any effect on the discharge, permit, or any alleged violation.

2. **Duty to Provide Information**

The permittee shall furnish to the Division, within the time frame specified by the Division , any information which the Division may request to determine whether cause exists for modifying, revoking and reissuing, or terminating coverage under this permit, or to determine compliance with this permit. The permittee shall also furnish to the Division, upon request, copies of records required to be kept by this permit.

B. RESPONSIBILITIES (cont.)

2) In the case of termination, the permittee has ceased any and all discharges to state waters and demonstrates to the Division there is no probability of further uncontrolled discharge(s) which may affect waters of the State. Alternately, the permit may not be needed and coverage may be terminated if the facility qualifies for the No Exposure Exclusion and the permittee complies with the requirements outlined in Section 61.3(2)(h) of the State Discharge Permit System Regulations;

3) The Division finds that the permittee has shown reasonable grounds consistent with the Federal and State statutes and regulations for such modification, amendment or termination;

4) Fee requirements of Section 61.15 of State Discharge Permit System Regulations have been met; and

5) Applicable requirements of public notice have been met.

5. **Permit Violations**

Failure to comply with any terms and/or conditions of this permit shall be a violation of this permit.

Dischargers of stormwater associated with industrial activity, as defined in the EPA Stormwater Regulation (40 CFR 122.26(b)(14), which do not obtain coverage under this or other Colorado general permits, or under an individual CDPS permit regulating industrial stormwater, will be in violation of the federal Clean Water Act and the Colorado Water Quality Control Act, 25-8-101. Failure to comply with CDPS permit requirements will also constitute a violation. Civil penalties for such violations may be up to $10,000 per day, and criminal pollution of state waters is punishable by fines of up to $25,000 per day.

6. **Legal Responsibilities**

The issuance of this permit does not convey any property or water rights in either real or personal property, or stream flows, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of Federal, State or local laws or regulations.

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject to under Section 311 (Oil and Hazardous Substance Liability) of the Clean Water Act.

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable State law or regulation under authority granted by Section 510 of the Clean Water Act.

7. **Severability**

The provisions of this permit are severable. If any provisions of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances and the application of the remainder of this permit shall not be affected.

8. **Renewal Application**

If the permittee desires to continue to discharge, a permit renewal application shall be submitted at least ninety (90) days before this permit expires. If the permittee anticipates that there will be no discharge after the expiration date of this permit, the Division shall be promptly notified so that it can terminate the permit in accordance with Part II.B.4.d.

9. **Confidentiality**

Except for data determined to be confidential under Section 308 of the Federal Clean Water Act and Regulations for the State Discharge Permit System 61.5(4), all reports prepared in accordance with the terms of this permit shall be available for public inspection at the offices of the Division. The permittee must state what is confidential at the time of submittal.

COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT
Water Quality Control Division
WQCD-P-B2
4300 Cherry Creek Drive South
Denver, Colorado 80246-1530

RATIONALE

STORMWATER DISCHARGES ASSOCIATED WITH LIGHT INDUSTRIAL ACTIVITY

GENERAL PERMIT IN COLORADO

THIRD RENEWAL

COLORADO DISCHARGE PERMIT NUMBER COR-010000

I. INTRODUCTION

The permit is for the regulation of stormwater runoff from a wide variety of types of light industry. This Rationale will explain the background of the Stormwater program, which industries are covered under this permit, how to apply for coverage under this permit, and what the permit requirements are.

A. Changes in this General Permit

1. *Small Municipal Exemption: The previous Rationale included a discussion of the exemption from industrial stormwater permitting for small municipalities. This exemption ended as of March 10, 2003. Municipalities under 100,000 population are now subject to the same stormwater permitting requirements for their industrial facilities (e.g., gravel pits, wastewater treatment plants, construction projects) as other facility owners and operators. See http://www.cdphe.state.co.us/wq/PermitsUnit/SW-Muni-Ind-QA.pdf for further information. No changes were made to the permit for this item.*

2. *Application Requirements: The permit application requirements have changed slightly to require an email address, if available. See Part I.A.2.b.*

3. *Temporary Coverage: Part I.A.3.d of the permit dealt with temporarily covering a facility under the general permit even if an individual permit is more appropriate. This section essentially duplicated the previous section, and so it has been deleted.*

4. *Batch Plants: Information has been added to Part I.A.7 of the permit, indicating that a batch plant that is dedicated to a specific construction site may instead be covered under a CDPS Construction Stormwater general permit certification issued to that site, provided that the site's SWMP includes adequate provisions for the batch plant.*

5. *Stormwater Management Plan (SWMP)*

   a) ***Compliance Schedule**: For newly certified facilities, if the SWMP prepared in conjunction with the permit application requires a compliance schedule, it generally shall not exceed **60 days**. See Part I.B.*

   b) ***Site Map**: The requirements for the SWMP have been changed to add several items to the site map, such as areas of industrial activities, potential pollutant sources, and sampling point. If a permittee's existing SWMP does not already contain these items, **the plan must be amended** to comply with these changes, by **September 1, 2006**. See Part I.B.2.*

   c) ***SWMP Certification**: The previous permit included a requirement that the copy of Stormwater Management Plan that remains at the facility had to include the certification language and signature, as described in Part I.D.5.a. This requirement has been deleted. The signatory requirements of Part I.D.5.a **only** apply to the SWMP if it is to be submitted to the Division or to EPA. See Part I.C.2.b.*

II. BACKGROUND

The Environmental Protection Agency (EPA) requires that industrial stormwater discharges be regulated under the National Pollutant Discharge Elimination System (NPDES) program. (Note: The Colorado program is referred to as the Colorado Discharge Permit System, or CDPS, instead of NPDES). The Water Quality Control Division ("the Division") has stormwater regulations (5CCR 1002-61) in place. These regulations require specific types of industrial facilities that discharge stormwater associated with industrial activity (industrial stormwater), to obtain a CDPS permit for such discharge. A facility which discharges industrial stormwater either directly to surface waters or indirectly, such as through municipal separate storm sewers, must be covered by a permit.

A. General Permits

The Division has determined that the use of general permits is the appropriate procedure for handling most of the thousands of industrial stormwater applications within the State.

1. Types of General Permits: This permit covers a broad range of light industrial activities (see Section III.A of the Rationale). Other stormwater general permits cover industrial activities for heavy industry, auto recycling, sand and gravel operations, construction activities and mining.

2. General vs. Individual Permit Coverage: Currently unpermitted facilities which the Division determines need to be covered under an individual permit (see criteria in Part I.A.6 of the permit) may be temporarily covered under a general permit, if the Division determines that the benefits of immediate coverage outweigh the difference in permit requirements. The temporary coverage will be inactivated once an individual permit is issued (see Part I.A.3.c).

   Certification of a facility under a general permit does not in any way infringe on the Division's right to revoke that coverage and issue an individual permit or amend an existing individual permit, when such specialized facility attention is required.

B. Categorical Industries

Discharges of industrial stormwater must meet all applicable provisions of Sections 301 and 402 of the Clean Water Act. These provisions require control of pollutant discharges from categorical industries to a level equivalent to Best Available Technology Economically Achievable (BAT) and Best Conventional Pollutant Control Technology (BCT), and any more stringent controls necessary to meet water quality standards.

EPA regulations (40 CFR, Subchapter N) establish numeric effluent limitations for stormwater discharges from facilities in some of the industrial categories. For these facilities, the numeric effluent limitations constitute BAT and BCT for the specified pollutants, and must be met to comply with this program. Currently, all facility types with numeric effluent limits for stormwater are covered under the general permit for Heavy Industrial Activity, COR-020000. See the permit for Heavy Industry for a list of affected industries.

C. Permit Requirements

This permit does not require submission of effluent monitoring data in the permit application or in the permit itself. These light industries are considered to typically have a low potential for pollutant levels in their stormwater discharges which would cause a water quality impact, due to the nature of activities occurring on site and the types of materials handled.

The narrative requirements include prohibitions against discharges of non-stormwater. They require dischargers to control and eliminate the sources of pollutants in stormwater through the development and implementation of a Stormwater Management Plan (SWMP). The plan must include BMPs, which may include treatment of stormwater discharges along with source reduction. As per EPA, a fully implemented SWMP will constitute compliance with BAT and BCT. It is believed that BMPs are all that is necessary to control water quality impacts. If the Division determines that additional requirements are necessary, they may be imposed as follows: 1) at the renewal of this general permit or through an industry-special general permit if the issue is categorical; 2) through direction from the Division based on the implementation of a TMDL if the issue is watershed-based; or 3) if the issue is site-specific, through guidance from the Division, based on an inspection or SWMP review or through an individual permit.

III. STORMWATER DISCHARGES ASSOCIATED WITH INDUSTRIAL ACTIVITY (cont.)

Transportation facilities which have vehicle maintenance, fueling, equipment cleaning or airport deicing, including:

40	*Railroad transportation*
41	*Local and suburban transit and interurban highway passenger transportation*
42	*Motor freight transportation and warehousing (except 4221, 4222, 4225)*
43	*U.S. Postal Facilities**
44	*Water transportation*
45	*Air transportation (facilities that use less than 1000 gallons of deicer(s) annually, and/or that have annual fuel sales of less than one million gallons/year)*
5171	*Petroleum bulk stations & terminals*

**The Division currently does not have permitting authority over federal facilities. Should this change during the life of this permit, facilities under SIC Code 43 may be covered by this permit.*

Although the Office of Management and Budget's North American Industry Classification System is intended to replace the 1987 Standard Industrial Classification Code, Colorado has decided to continue using the 1987 SIC code system as the primary classification system under Colorado's stormwater permits because the stormwater regulations (Colorado Discharge Permit Regulations, Reg. 61) refer to these codes and because this code system identifies facilities adequately. EPA is implementing the same policy in its Multi-Sector General Permit.

For any facilities that do not require coverage under the stormwater regulations, but still wish to be covered under this general permit, the Division reserves the right to certify them under this permit.

The Division also reserves the right to include under this general permit any specific facility not otherwise covered. This determination would be based on the reasonable potential of a specific industrial discharger to contribute to a violation of a water quality standard, or to be a significant contributor of pollutants to state waters.

IV. APPLICATION AND CERTIFICATION

Certification under the permit requires submittal of an application. Upon receipt of all required information, the Division may allow or disallow coverage under the general permit. See Part I.A.3 of the permit for an outline of the applicable time frames.

*At least **thirty days** prior to the anticipated date of discharge, the owner (or operator when the owner does not operate the facility) of the facility shall submit an application as provided by the Division. (**Note** - Under the Federal regulations, this is referred to as a **Notice of Intent**, or **NOI**. For internal consistency with its current program, the Division will continue to use the term "application.")*

Refer to Part I.A.2.b of the permit for a description of what must be included in an application for coverage under this permit.

If this general permit is applicable, then a certification will be developed and the applicant will be certified under this general permit.

V. TERMS AND CONDITIONS OF PERMIT

A. ***Stormwater Management Plans (SWMPs)**: The purpose of a SWMP is to identify possible pollutant sources to stormwater and to set out best management practices that, when implemented, will reduce or eliminate any possible water quality impacts. A SWMP shall be developed for each facility covered by this permit. SWMPs shall include BMPs that are selected, installed, implemented and maintained in accordance with good engineering practices to minimize pollutants in the discharge so that the discharge will not cause or contribute to an excursion above any applicable water quality standards. (The plan need not be completed by a registered engineer.)*

The Division has a guidance document available on preparing a SWMP. The document is on the Division's website at www.cdphe.state.co.us/wq/PermitsUnit.

VII. RESPONSE TO PUBLIC NOTICE COMMENTS

The Division received comments on the proposed amendment from the Environmental Protection Agency. Based on these comments, the following changes/clarifications were made to the renewal permit:

A. ***Temporary Coverage:*** *Part I.A.3.d was deleted, as it was redundant. See Section I.A.3 of the Rationale.*

B. ***Batch Plants:*** *Part I.A.7 has been expanded to provide additional explanatory information about permit coverage for asphalt and concrete batch plants. See Section I.A.4 of the Rationale.*

Kathryn Dolan
May 25, 2006

Appendix B, SARA Title 313 Substances

Appendix C, Spill Report Form

Appendix D, Training Documentation

Appendix E, Inspection Report Forms

Appendix F, Records of Spills and Leaks

Appendix G, Monitoring Records

Section 8 – Technical Support Appendices

Appendix 8.N **Summary of Public Hearings and Process**

Meeting minutes from City of Loveland Utilities Commission meeting in which the Utility Plan was reviewed.

LOVELAND UTILITIES COMMISSION
April 21, 2010 Minutes

Call to Order:
Chairman Gary Hausman called the meeting to order at 4:00 p.m.

Present:

Commission members: Darell Zimbelman, David Schneider, Dan Herlihey, CJ McKinney, Gary Hausman, Gene Packer, John Rust Jr., John Matis, & Randy Williams.

Council Liaison: Cathleen McEwen

City Staff members: Ralph Mullinix, Steve Adams, Bob Miller, Greg Dewey, Sarah Smith, Glenna Depperschmidt, Tracey Hewson, Sharon Citino, Jim Lees, Gretchen Stanford, Richard Martinez, Lindsey Bashline, Darcy Hodge, Michael McCrary, Tom Greene, Chris Matkins, Brian Burson, & Mike Scholl.

Guests: Adam Perry & Paul Davis with Platte River Power, & Bill McCreary (Citizen)

Approval of Minutes: Gary Hausman asked for a motion to approve the minutes of the March 17, 2010 meeting.

- **MOTION:** John Rust Jr. made the motion to approve the minutes of the March 17, 2010 meeting as written.
- **SECOND:** Dan Herlihey seconded the motion. The minutes were approved unanimously.

Citizens Report:

- None

***Commission Reports*:**

Gary Hausman:

Dan Herlihey: Attended Spring Waters users meeting on April 7th it was interesting and enlightening as usual. Would like to wish Eric Wilkinson from NCWCD a full recovery.

John Matis: None

John Rust Jr: I move that the board send a get well card to Eric Wilkinson. I also attended the Spring Waters users meeting. A lot of regulations seem to be going into effect with not much input.

Dave Schneider: None

Darell Zimbelman: Dale Mitchell of Northern Water has passed away, and I move to send the family thanks for all he has done. John Rust Jr. has seconded. The staff will draft a letter and proclamation.

CJ McKinney: None

Gene Packer: None

Randy Williams: None

Council Report: Cathleen McEwen

- There were no Water and Power items on the City Council Agenda for March 23rd, April 6th or April 20th.

Director's Reports: Steve Adams

- Passed around card for Eric Wilkinson to have Commissioners to sign.
- Organic Contract & Power Supply Agreement was sent back to Fort Collins Board.
- April 12th, meeting outcome was to continue negotiating the language.
- May 11, 2010 Study Session in Fort Collins.
- Tri-City Event is all setup for May 20, 2010 (697 Denver Ave.).
- 3 LUC terms are up in June 2010. Each member was given applications to reapply.
- Smart Grid has been postponed for a few years due to cost escalations seen by other cities.
- Still working with Johnstown on the Water trade.
- Chris Matkins has been offered and accepted the Senior Civil Engineer position.
- Handout of email that was forwarded to Ralph from Darin Atteberry regarding Loveland Town Hall Meeting on March 31, 2010.
- Handout of article regarding L.A. Spars over Green Energy.
- Handout for the 35th Annual Colorado Water Workshop.
- Loveland Utilities Commission Comp Plan – 2010.

REGULAR AGENDA:

ITEM 1: Residential Survey Results White Paper and Recommendations on Residential Programs

Loveland Water and Power (LW&P) surveyed 3,000 residential customers on energy efficiency. On January 20, 2010, W& P staff shared the survey results with the Loveland Utilities Commission and recommended that the results be used to guide us in future program development. During the next few months, staff has been evaluating the costs and benefits of the various residential energy efficiency programs and made a recommendation to LUC as to which programs could be implemented.

Rich Martinez, Lindsey Bashline and Gretchen Stanford presented (8) residential programs to implement in the City of Loveland.
Rich, Lindsey and Gretchen are looking for feedback on the programs that were presented as well as any recommendations on other programs to research and bring back to you in May.

- **MOTION:** Dave Schneider made a motion to move forward and discuss a rate increase for the programs. After Commission discussion Dave Schneider withdrew the motion.
- **SECOND:** Darell Zimbelman seconded the motion.

- **MOTION:** Dave Schneider made a motion to have materials discussed given to Commissioners to study and bring back questions and concerns to the May 19, 2010 meeting.
- **SECOND:** Darell Zimbelman seconded the motion. The motion was approve**d** unanimously**.**

ITEM 2: Approval of Engineering Contract for WWTP WAS Thickening Project – Tom Greene

The City of Loveland's Wastewater utility budgeted $560,000 in 2010 for the design of a Waste Activated Sludge (WAS) thickening facilities and associated scum and solids handling improvements to be constructed at the Wastewater Treatment Plant (WWTP). The purpose of this facility is to improve and expand the solids processing capabilities. The WAS facility will be replacing the dissolved air flotation thickener (DAFT) which has reached it useful life.
The WAS thickening building will be designed to facilitate two (2) Rotation Drum Thickener's (RDT), polymer system, thickened sludge hopper and pumps. Odor control will use carbon absorption system. The facility will be designed to accommodate an adjacent future build containing centrifuge dewatering units. The electrical systems (motor control centers, MCC) and laboratory analysis area will be designed to serve the proposed WAS facility and future centrifuge building.
The Water and Power department has negotiated a professional services contract with CH2M Hill (Consultant) to perform the engineering design and bidding services in the amount of $539,538.00.

Staff recommended that the Loveland Utilities Commission adopt a motion awarding the engineering contract for the Wastewater Treatment Plant WAS Thickening project to CH2M HILL in the amount of $539,538.00 and authorize the City Manager to sign the contract on behalf of the City.

- **MOTION:** Darell Zimbelman made the motion to award the engineering contract for the Wastewater Treatment Plant WAS Thickening project to CH2M HILL in the amount of $539,538.00 and authorize the City Manager to sign the contract on behalf of the City.
- **SE*C*OND:** John Rust Jr. seconded the motion. The motion was approved unanimously.

ITEM 3: Review of Wastewater Utility Plan –Chris Matkins

The City of Loveland wastewater utility is located in Larimer County and is part of the North Front Range Water Quality Planning Association. Section 208 of the Clean Water Act requires local planning entities to identify treatment works necessary to meet anticipated regional municipal and industrial waste treatment needs. In 2007, Loveland's regional planning entity (the North Front Range Water Quality Planning Association or NFRWQPA) updated the overall regional planning document to meet these requirements. In addition, NFRWQPA has required all public wastewater treatment agencies within the regional planning area to submit a Utility Plan to the association for review and acceptance prior to any new significant system improvements. Utility Plans are specific to each wastewater provider and include descriptions of treatment facility locations, capacities, technologies, and timing of anticipated expansions. In addition, each plan must also describe populations, service areas, partnerships, and regional water quality policies.

The Executive Summary of the City of Loveland's recently-completed Wastewater Utility Plan was provided for the Commission's review.

- **MOTION:** Randy Williams made the motion to submit the final Wastewater Utility Plan to City Council for review and approval, and then to NFRWQPA for review and approval.
- **SE*C*OND:** John Rust Jr. seconded the motion. The motion was approved unanimously.

ITEM 4: 2010 Quarterly Goals & Milestones Report
The purpose of this item is to provide a status update on the 2010 LUC goals. Attached separately is a listing of the goals as adopted by the LUC. Below each goal is a brief update based on the first quarter events of 2010.

STAFF REPORTS:

ITEM 5: Small Wind-Energy System Proposal - Brain Burson, Current Planning

The Current Planning office in collaboration with the City's Title 18 Committee has developed proposed amendments to the zoning code (Title 18 of the Municipal Code) that would allow for small wind-energy systems (wind turbines) to be located on residentially-zoned property.
Brian presented materials addressing the proposed code amendment regarding wind turbines that will be provided to the City Council for review at the April 27th study session. Current Planning staff would like to obtain feedback from the LUC on this proposal and provided feedback will be conveyed to the City Council.

ITEM 6: City Comprehensive Plan Update Presentation - Mike Scholl
The Comprehensive Plan, which was adopted in 2005, requires an updated every five years. The Implementation Plan identifies which City boards and commissions are responsible for taking the lead in achieving the objectives listed under each Goal. Goals fall under Guiding Principle, which in turn fall under five Vision Statements.
The Strategic Planning Division has provided each department a list of the objectives for the boards or commissions for which the department provides a staff liaison. The Water and Power Department was provided the objectives assigned to the Loveland Utilities Commission.
The first phase of the update project is to determine the status of each objective as far as actions taken or program initiated to achieve the objective. This first phase will be strictly a status. The second phase will involve a more in depth assessment of the objectives to determine if any are no longer relevant and if any need to be revised to reflect changes in related factors. It's possible that new objectives will be added.
This update is important because the objectives in the Comprehensive Plan should be incorporated into future work plans for departments and boards and commissions. Each board or commission will be asked to recommend approval of the revised objectives that will part of the five year update.

ITEM 7: Downtown Project Update – Mike Scholl

Mike Scholl presented several items he has been working on in regards to downtown efforts.
1. Rialto Bridge project
2. Façade Grant program
3. Downtown Development consultant

ITEM 8: March Financial Report Highlights – Jim Lees

The March 2010 financial reports were discussed for Commission review at the meeting.

INFORMATION ITEMS
ITEM 9a: Electric Legislative Update – Gretchen Stanford
Explanations of various State and Federal Legislation bills were provided for Commissioners.

ITEM 9b: Water Legislative Update – Greg Dewey
Explanations of various water-related bills were provided for Commissioners.

ITEM 10: Water Supply Update – Sarah Smith
ADJOURN
The meeting was adjourned at 7:36 p.m. The next LUC Meeting will be May 19, 2010.

Respectfully submitted,
Glenna Depperschmidt
Recording Secretary
Loveland Utilities Commission

Section 8 – Technical Support Appendices

Appendix 8.O **Infiltration and Inflow Study**

The 2008 Collection System Report for the City's ongoing Infiltration and Inflow Study is enclosed.

AYRES ASSOCIATES

MEMORANDUM

To:	Chris Matkins, City of Loveland Water / Wastewater Division
From:	Chris Pletcher and Sam Lowe
Date:	May 15, 2009
Re:	2008 Wastewater Modeling

Executive Summary

In June 2007, the City of Loveland commissioned Ayres Associates to conduct a wastewater flow monitoring program, and based on that flow monitoring data to construct a hydraulic model of the City's wastewater collection system. This memorandum summarizes the first two phases of the data collection conducted between June 2007 and November 2008. Three geographic basins were studied during the initial phase, based on the City's priority for development review analysis or scheduled capital improvement projects. In the second phase, conducted in the fall of 2008, flow monitors were deployed in the vicinity of Fairgrounds Park and in each of the six interceptors conveying flow to the Wastewater Treatment Plant (WWTP). The collection system lines for each modeled basin are shown in red in **Figure 1**.

1) East Side Lift Station Basin
2) Madison Basin
3) Carlisle Basin
4) Fairgrounds Park
5) WWTP Trunks

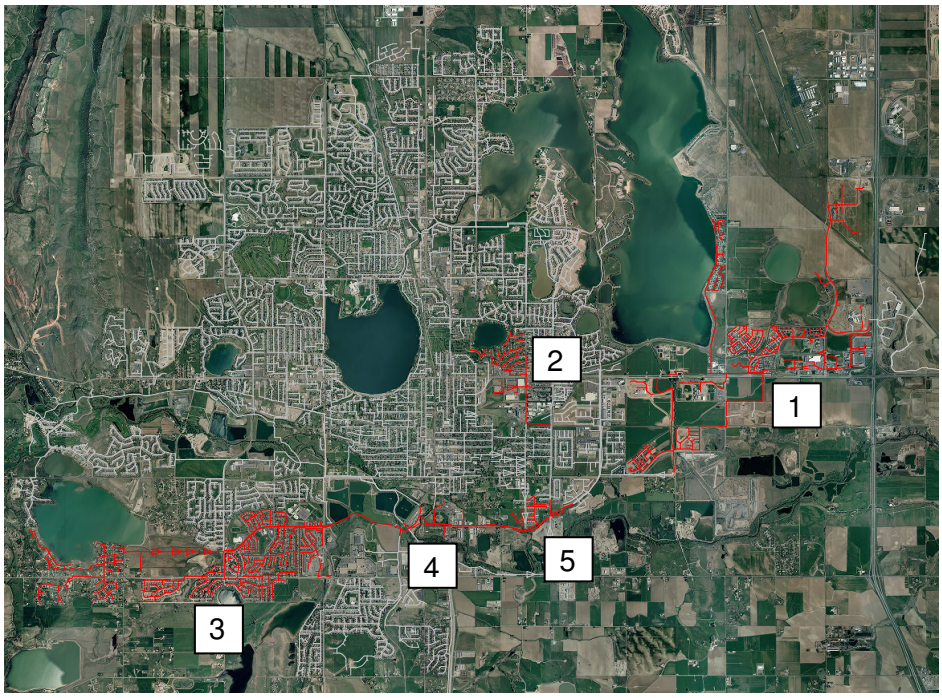

Figure 1. Site Map.

The first basin, the East Side Lift Station (ESLS) Basin, included the area tributary to the East Side Lift Station, generally from the east side of Boyd Lake to the Promenade Shops at Centerra east of Interstate-25. This basin was analyzed to determine capacity for additional development. The second basin, the Madison Basin, included the area from the southeast side of Silver Lake down Madison Avenue to the Great Western Railway tracks between 8th and 9th Streets. This basin was analyzed due to a history of sewer backup, including a basement flooding incident at the intersection of Madison and Nickel. The third basin, the Carlisle Basin, included the far southwest corner of the City, from the west side of Boedecker Reservoir to the 10" Carlisle sewer at South Railroad Avenue, generally bounded on the north by Eagle Drive and on the south by the wastewater service area boundary. This basin was analyzed to confirm the available capacity of the aging 10" Carlisle line and to identify the cause of apparent surcharges in the reach that runs through the low lying agricultural fields between Taft and Railroad Avenues.

In summary, the following conclusions were made to the specific issues identified for each basin. For the East Side Lift Station Basin, no short-term hydraulic capacity limitations were identified. Significant additional flow may be added to the existing pipe network without causing hydraulic capacity issues (Future flow monitoring in these locations is recommended to track increases in flow due to growth). However, due to the oversized pipe and flatter pipe slopes, upper pipe reaches are experiencing septicity problems and deposition of solids. These environments were typically found to be quite corrosive to metal equipment, but most of the manholes are fairly new and in good condition. Flows from the Promenade Shops at Centerra were found to peak at 175 gpm on October 27, 2007 compared to a design capacity at 75% full of 852 gpm. At this peak flow, the 24" pipe under Interstate-25 was 16% full based on depth.

For the Madison Avenue Basin, while the pipe diameters are small compared to the tributary area, pipe capacity was not identified as an issue that would lead to the history of backups. However, significant grease accumulation was identified in this area that requires regular (i.e., monthly) jetting to keep the lines clear. This basin is nearly built-out; therefore additional customer flow is not anticipated. We do recommend, however, that the industrial pretreatment program be extended to existing commercial establishments as well as to redevelopment or new development. Without the grease interceptors required by the pretreatment program, existing restaurants will continue to dispose of fats, oils and greases (FOG) into the wastewater collection system, causing additional maintenance burden and risk of backup to the City and other residents.

For the Carlisle Basin, the City has scheduled a capital improvement project to construct a parallel sewer along the 10" Carlisle line from Taft Avenue to Railroad Avenue. This project was based on an assumed capacity bottleneck that has led to apparent surcharges in the manholes. The flow monitoring conducted in this critical line from 10/4/07 to 1/8/08 and 3/28/08 to 7/1/08 captured a peak discharge of 615 gpm, which represents approximately 72% full in the pipe monitored based on depth. This was a single event. The next highest flows recorded were two events at approximately 550 gpm, then 4 events at 530 gpm. When we use the flows captured by the flow monitors and apply those flows to the entire tributary area, we have determined that a stretch of pipe in between our two flow monitor locations is susceptible to full-flow conditions under dry weather load conditions. This reach of pipe is approximately 1873 feet long, and runs from the bottom of the hill at Split Rock Drive / Carlisle at Taft Avenue to about mid-way to Railroad Avenue. Based on these flows, we agree that it is time to begin planning a parallel pipe replacement for the existing 10" line, along with regular inspections of the line for debris or potential backups. Portions of this 10" pipe do not have adequate margin for handling debris or grease plugging. However, at the present time this pipe appears to be staying clear and not experiencing flow spikes that are significantly beyond the pipe capacity. Therefore, we recommend that the 10" Carlisle pipe from Taft Avenue to Railroad Avenue remain listed on the

5-Year Capital Improvement Plan, and be designed and built as soon as practical. Postponing the construction of this capacity improvement until additional growth occurs in the Carlisle Basin will increase the City's risk of a large scale backup and potential sewer overflow into the agricultural area and Ryans Gulch drainage.

The sewer network in the vicinity of the Fairgrounds Park was studied to gain an understanding of the complex network of pipes and diversions in the area. Fairgrounds Park sits on the location of the City's original WWTP location. As a result much of the City's sewer network flows to this point. Five lines of 15" diameter or greater flow to this point and two lines are used to actively convey this flow to the current WWTP. A third line can be used to convey flow to the WWTP via the Southside Lift Station however a diversion gate keeps all but the highest flows out of this line. This third line is not normally used due to deteriorated reinforced concrete pipe material.

The trunk lines conveying flow to the WWTP were monitored in the fall of 2008 to aid in an organic sampling effort to identify sources of high concentration BOD in the collection system. The flow monitoring that occurred in these trunk lines captured the City's entire sewer flow. In regards to the WWTP's daily volume, we were able to determine the percentage of flow from each of the lines. The data collected at these trunks will also serve as a starting point as we continue monitoring flow in each interceptor, starting from the Plant and working upstream.

With regard to the overall collection system studied during this phase, we have observed minor amounts of infiltration due to either prevailing groundwater levels or the influence of a nearby ditch. However we have not identified any locations where the infiltration is significant enough to warrant repair for hydraulic reasons. (Evaluation of structural condition is completed by the City through their pipe camera inspection work.) Furthermore, during the limited wet weather events, we have seen only limited or rainfall-derived infiltration response in a few areas. This indicates that under the relatively dry ground conditions and lower precipitation patterns during the flow monitoring effort, the collection system studied is not significantly impacted by wet weather flows. Extended duration storms, higher levels of antecedent soil moisture conditions and more intense rainfall may reveal greater susceptibility to inflow and infiltration, but we have not observed these conditions to a significant extent during our effort.

Additional details on the data collection effort and construction of the hydraulic model are provided below. Manhole sketches and condition assessments are provided in **Appendix B**, along with graphs showing the flow data collected at each of the locations.

Introduction

This technical memorandum summarizes the work performed by Ayres Associates from June 2007 to November 2008. This represents the first two phases of an ongoing effort to construct a real-world hydraulic model of the City's wastewater collection system using in-pipe wastewater flow monitoring to calibrate the hydraulic model to represent actual conditions. Historically, sewer hydraulic models were based on textbook assumptions for flows and pipe roughness, with peaking factors applied to the flows to account for uncertainties in the daily pattern of flows and different use patterns for different customers. Due to calculation limitations, pipe networks were simplified to just the main trunk lines, with no analysis completed for smaller pipes. In recent years, desktop computing power has increased dramatically, and hydraulic modeling software has advanced to take advantage of the increased computing power. In combination with the data available in the City's GIS system, it has now become practical to construct a model of the entire City's wastewater collection system using real flow and pattern data to represent actual hydraulic conditions. This results in a significantly more useful and accurate model of the entire City's wastewater collection system.

In order to gather sufficiently detailed flow data, the City was broken up into large sewer basins that are tributary to a significant design point – either a single interceptor pipe or a lift station. Within each large basin smaller sub-basins were identified, corresponding to the City-generated sewer jetting basins. Ayres Associates then compiled a plan to collect flow monitoring data over the entire City through the course of four to five years. While the order and priority of the plan remains flexible, it achieves the goal of breaking the entire collection system down into manageable pieces for both flow data collection and construction of the model. The first three focus areas were identified as the East Side Lift Station Basin, the Madison Avenue Basin, and the Carlisle 10" pipe Basin. These basins were selected based on the City's priority for development review analysis or scheduled capital improvement projects. The first basin included the area tributary to the East Side Lift Station, generally from the east side of Boyd Lake to the Promenade Shops at Centerra east of Interstate-25. This basin was analyzed to determine capacity for additional development. The second basin included the area from the southeast side of Silver Lake down Madison Avenue to the Great Western Railway tracks between 8th and 9th Streets. This basin was analyzed due to a history of sewer backup, including a basement flooding incident at the intersection of Madison and Nickel. The third basin included the far southwest corner of the City, from the west side of Boedecker Reservoir to the 10" Carlisle sewer at South Railroad Avenue, generally bounded on the north by Eagle Drive and on the south by the wastewater service area boundary. This basin was analyzed to confirm the available capacity of the aging 10" Carlisle line and to identify the cause of apparent surcharges in the reach that runs through the low lying agricultural fields between Taft and Railroad Avenues.

A breakdown of the pipe sizes and pipe materials per basin, based on data imported from the City GIS, is provided in the Appendix B.

The 2008 model includes 1,467 of the City's 8,616 manholes (17%) and 1,466 of the City's 8,686 pipes (17%).

City Demographics

The data collection effort completed in 2007 and 2008 represents a City population of approximately 62,910, however the City limits and wastewater service area do not follow the same boundaries. City growth patterns at this time represent a slowing period of new construction with residential projects effectively stopped and commercial projects moving slowly. Overall flow patterns at the City of Loveland Wastewater Treatment Plant show stable peak month flows since 2003 at just less than 7 MGD, while BOD values show a significant increasing trend over the same time period, from approximately 13,000 pounds per day of BOD to approximately 18,000 pounds per day. These trends are generally thought to reflect the continued installation of low flow water fixtures in new construction and renovation work, which offsets an increase in flow due to new growth. Demographics for the individual basins studied in this effort were not available at the time of this report.

Project Process

In order to complete the data collection, analysis and model construction required for this project, the following tasks were undertaken: flow monitor purchase, data collection effort, data analysis, construction of the sewer model and compilation of the observations and recommendations. The entire scope of work is included in **Appendix A** for reference. Each phase is described in more detail below.

Flow Monitor Purchase

Following Notice to Proceed on the project in June 2007, Ayres began to investigate wastewater flow metering equipment suitable for the job to develop a competitive purchase process. The City of Loveland was looking for equipment that could measure the flow rate in the City's sewer system, suitable for wet and at times submerged service, extended battery life and adequate data storage capacity. There are various ways for sensors to measure the flow rate in a sewer, but most vendors use a submerged sensor which sends out ultrasonic sound waves to determine the velocity (similar to a Doppler radar gun) and a pressure transducer to measure the depth of the flow. An ultrasonic sensor can also be mounted above the flow and be used to measure the depth of flow; however, a second, submerged, sensor is still typically needed to measure the velocity. The ultrasonic depth sensors are ideal in low-flow locations since they can accurately read shallow depths from above. Pressure transducers are placed in the flow and therefore do not read shallow flow as accurately due to the flow disturbance caused by the sensor housing. Ayres recommended a minimum 3-month battery life and data storage capability, along with sealed units capable of withstanding complete submergence in a surcharged manhole. In addition, we recommended that data download be accessible through a laptop computer. A copy of the bid specifications is included in Appendix A. A total of 16 standard area-velocity sensors and 2 supplemental ultrasonic depth sensors were solicited, along with related pipe installation hardware and connection cables.

It was determined that multiple vendors could provide the equipment necessary to provide the flow information the City was looking for. Therefore, the City opened up a competitive bid selection process. The City of Loveland received 7 bids from 4 different companies. The bid results can be seen in the appendix. The purchase was awarded to Teledyne Isco due to it being the only conforming bid. Their bid was also the lowest bid which was providing new equipment and the second lowest bid overall.

The City ultimately purchased 14 flow monitors, 2 ultrasonic depth sensors and 4 rain gauges. One of the ultrasonic depth sensors was exchanged for 2 additional flow monitors after the first flow monitoring cycle.

Data Collection Effort

Fourteen flow monitors and four rain gauges were installed in early October 2007 to collect flow data in the East Side Lift Station and Madison Basins, and obtain a preview of two critical manholes in the Carlisle basin. The remainder of the Carlisle basin was monitored during spring 2008. Ayres Associates staff conducted a manhole reconnaissance to locate and identify suitable manholes for flow monitoring. At each manhole, sketches were made of the manhole configuration and the structural condition was assessed. These rating sheets are provided in Appendix B. During later phases of the project, photos were also taken of the manhole invert. The installation of the flow monitor equipment consists of two tasks; physically placing the Area/Velocity (AV) sensor in a pipe at the bottom of a manhole as well as configuring the 2150 module (data collector) that the sensor is connected to.

To install or remove a sensor it is necessary for a person to enter the sanitary sewer manhole. Since a manhole is a confined space all the necessary precautions were taken to comply with the City of Loveland's confined spaced program. For each entry, confined space permits were filled out by the City, a tripod, man-winch and harness were used to provide for a non-entry rescue, an air monitor was continuously measuring the atmosphere and personal protective equipment (hard hat, harness, boots and gloves) was worn by the entrant. Hazardous atmospheres were encountered at some manholes, and were mitigated with active ventilation. All staff on the entry team was trained on first aid and confined space safety.

The equipment to be installed includes an area-velocity (AV) sensor attached to a metal ring that is secured inside the upstream pipe. The AV sensor is attached to a stainless steel ring – either a one piece "spring ring" for pipes up to 15" diameter, or a modular large diameter ring for pipes 16" and larger. The "spring ring" remains in place by friction against the pipe wall, while

the larger modular ring uses a scissor jack to secure the ring inside the pipe. Once in the pipe, the ring expands and compresses against the inside of the pipe and holds the sensor in place. The ring itself does not impact the flow, but the sensor body can impact the flow at depths less than an inch and a half.

After physically installing an AV sensor, the data collection module is connected and configured for a particular site. Configuring a module consists of giving it a name, providing the pipe or channel geometry (shape and size), setting the frequency of data collection and calibrating the depth sensor. At each site flow depth, flow velocity, flow rate, along with flow temperature were collected at 15 minute intervals. Logic was written into the module to take the above readings at 5 minute increments if a pipe was ever greater than 3/4 full. In addition, battery voltage and total flow were recorded on a daily basis.

Approximately a week after the equipment was installed, each site was revisited and the data collectors were downloaded. This initial visit provided an opportunity to see if the sensor was causing any negative affects to the collection system and to verify that useful data was being collected. If an AV sensor wasn't providing good data, the senor could either be adjusted or moved to a better location. After the initial data download, the flow modules were inspected and downloaded once a month. These downloads were important, allowing monthly inspection of the manholes and equipment as well as checking to make sure the data being collected was good and the batteries were still providing sufficient power.

Most sites were collecting good data but some locations were not. Of the two measured parameters, depth and velocity, velocity is more prone to poor readings. If toilet paper or rags catch on a sensor the ultrasonic Doppler signal is unable to accurately read velocity. Other causes of poor velocity readings we've encountered include a sensor covered by silt, pebbles in front of sensor and a large object (such as a piece of asphalt) sitting directly in front of the sensor. When obstructed, the velocity readings jump to values that are clearly wrong (+/- 10 to 15 ft/sec). When the velocity data is graphed it is easy to spot when the sensor becomes obstructed because a relatively smooth pattern suddenly jumps to a clearly incorrect reading. Even while the velocity sensor is obstructed or covered in silt, the pressure transducer continues to collect accurate level data. As long as there is accurate level data the flow rate can be recreated for intermediate intervals without the velocity data. Either the incorrect velocity data can be edited to match a typical pattern seen at similar times within the collected data, or the Manning equation can be used. The Manning equation only needs the level from the data collector, and measured values for pipe diameter, surveyed slope and an assumed roughness coefficient. To use the Manning equation to fill in the areas of bad velocity data, the Manning n-value can be adjusted for the entire period of record until the Manning's flow rate matches the accurate AV flow rates measured by the sensor. Once the Manning n-value has been determined it can safely be used to fill in the gaps in the remainder of the flow rate data.

Data Analysis

After the 3-month flow monitor deployment is over, the data is downloaded for the last time and the sensor is removed from the manhole. The data is now ready to be analyzed to determine the following flow components: customer flow, infiltration, and inflow (**Figure 2**).

Base infiltration is the first component we extract from the flow data. This is done by looking at the minimum flow values for each day. Minimum flows tend to occur during the middle of the night when the majority of the population is sleeping. However, a small, unknown portion of these minimum flows are due to customer flow (toilets, sinks, showers, dishwashers). Because of this small but consistent night-time customer contribution we took the minimum flow value recorded over the entire period of record as the base infiltration. This method takes the night where the least amount of customer flow was observed and considers that flow the base infiltration.

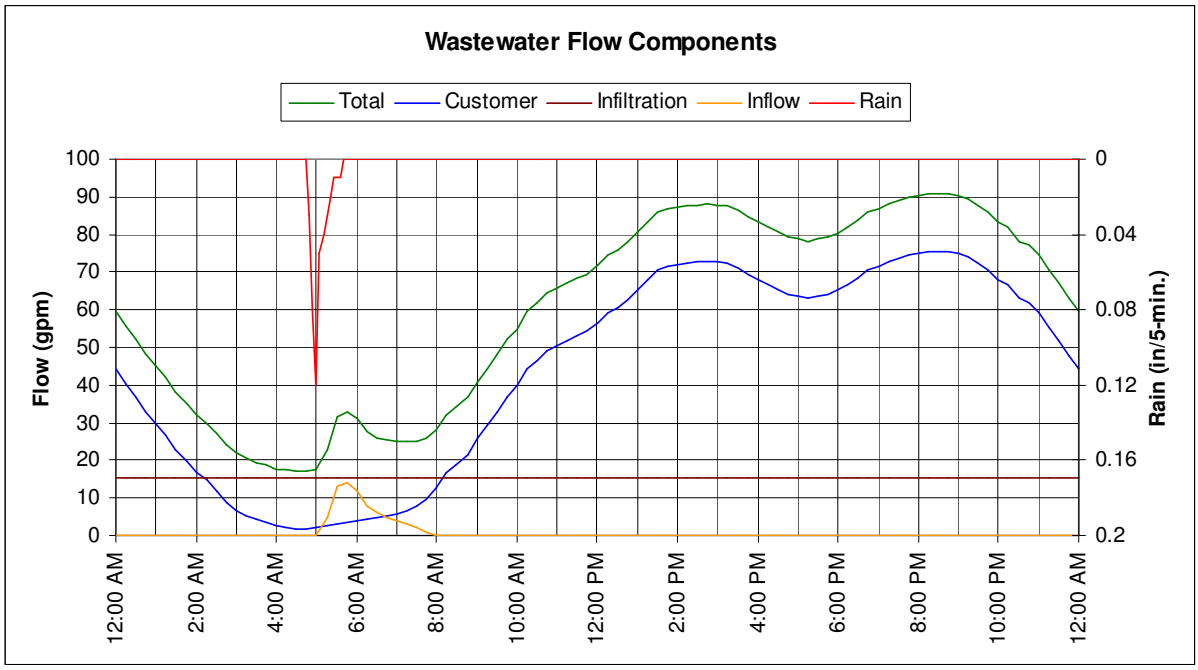

Figure 2. Wastewater flow components.

Infiltration occurs when groundwater enters the sanitary sewer pipe. The benefit of looking at a three-month period, specifically one that spans two seasons, is that we can look to see if there is a seasonal change in the infiltration. In the middle of winter the ditches are not running and precipitation is not recharging the groundwater due to the frozen ground. The infiltration seen at this point is considered the "base" infiltration since it occurs year round. When the irrigation ditches are actively carrying flow, typically between April and October, the adjacent groundwater tends to rise. During this time precipitation has the potential to recharge the groundwater as well. The increase in infiltration during this season can be attributed to "irrigation" infiltration or "rainfall-derived" infiltration, depending on the weather patterns indicated by the rain gauges.

Inflow is another flow component than can be identified from the flow monitor data. Inflow differs from infiltration in that the increase in flow occurs immediately after a rain storm and tends to be short and intense. Inflow occurs where surface water flows directly into the sewer system. This can occur at manhole lids, sump pumps or roof drains illegally connected to the sewer system.

Once the infiltration and any inflow are subtracted out of the total flow all that is left is "customer" flow. Customer flow can be defined as wastewater resulting from the normal indoor use of water that is plumbed directly into the sewer system. The customer flow from each flow monitor site was analyzed and reduced down to flow for a typical day. The typical day flows were then divided by the average flow to get a typical, daily pattern for each site. The patterns were input into the hydraulic model to represent the usage patterns for various types of customers. **Figure 3** shows patterns that were used in the 2007 model. As additional unique customer types are identified, new patterns will be added to the model.

In 2008, flow monitors were placed in each of the six "trunk" lines that convey flow to the plant. Data from each line was analyzed and the following patterns were obtained (**Figure 4**). These patterns will be used to check the model's accuracy at the downstream end of each of the six major basins.

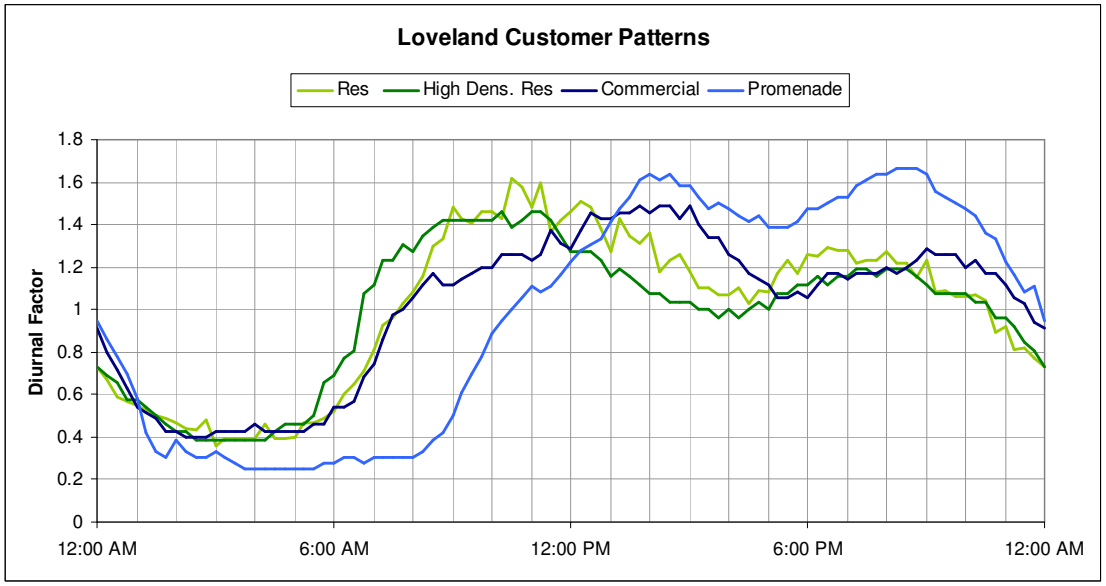

Figure 3. Loveland Customer Patterns.

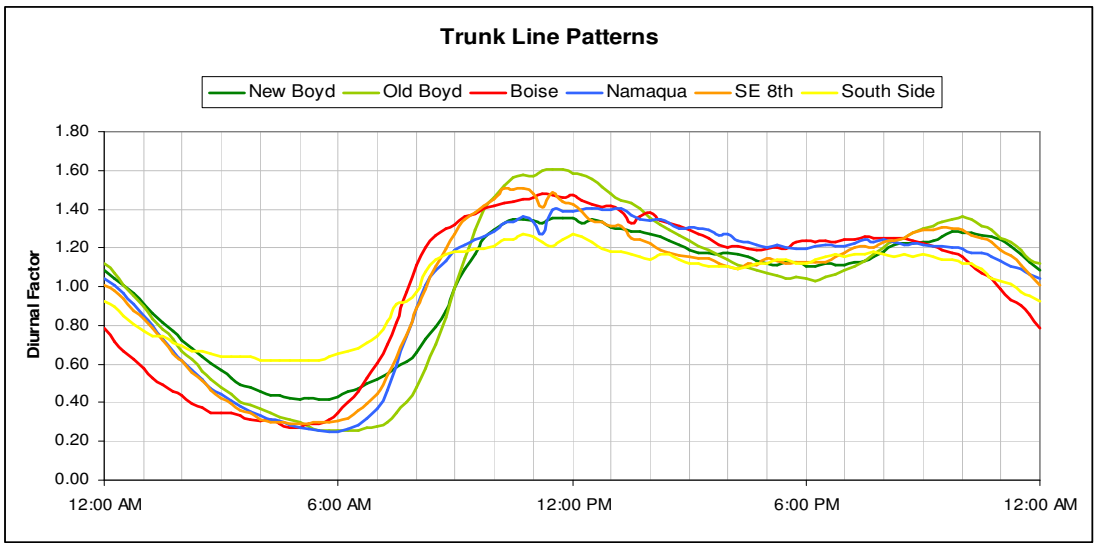

Figure 4. Trunk Line Patterns.

Another aspect of the data analysis was to calculate the operational Manning n-value of each line that was monitored. Since the pipe geometry (diameter and slope) was known and a velocity was recorded every 15 minutes, the Manning equation was rearranged to solve for the roughness (n-value) at each time step. The Manning n-values were then plotted over the whole time frame. A quick glance at the plotted Manning n-values show the typical n-value for that site over the entire period of data collection. The visual inspection is a good way to eliminate extreme values from consideration (i.e., taking a visual average). Review of the data for the East Side Lift Station basin shows that under lower flow conditions, the Manning n-values are typically overestimated. More typical values for Manning n are found in pipes running half to three-quarters full. Operational roughness values were also identified much lower than textbook values in some locations, which is typical for pipes without grease issues, installed steeper than minimum slope, and experiencing regular flows above half full. Calculated roughness values are presented in the **Table 1**.

Table 1. Calculated Roughness Values.						
Site #	Name	Basin	Pipe Diam. (in)	Pipe Type	Slope (%)	Manning n
MH 3958	WilsonJct-8"	Carlisle	8	PVC	0.51	0.015
MH 3930	Boedecker Field	Carlisle	8	PVC	0.53	0.004
MH 4008	Elbert	Carlisle	8	PVC	1.40	0.012
MH 4007	Elbert & 10th	Carlisle	8	PVC	1.57	0.008
MH 4597	RV Park	ESLS	10	PVC	0.39	0.011
MH 6795	Piney River	ESLS	10	PVC	0.60	0.011
MH 3654	D/S Manhole	Madison	12	PVC	0.42	0.008
MH 3958	WilsonJct-12"	Carlisle	12	PVC	3.19	0.014
MH 4866	Walt. Clark 15"	Carlisle	15	PVC	0.15	0.015
MH 4587	Carinos	ESLS	15	PVC	0.22	0.025
MH 8074	Promenade	ESLS	24	PVC	0.01	0.006
MH 6768	Hahns Peak	ESLS	24	PVC	0.03	0.010
MH 7114 N	Corvus	ESLS	30	PVC	0.21	0.007
MH 6786	McWhinney	ESLS	36	PVC	1.64	0.040
MH 5904	New Boyd	WWTP	29	PVC	0.06	0.01
MH 5911	ESLS D/S	WWTP	24	PVC	0.05	0.004
MH 3601	Boise	WWTP	18	PVC	1.06	0.03
MH 1922	Dog Park	Fairgrounds	21	RCP	0.35	0.017
MH 1917	Namaqua 21"	Fairgrounds	21	RCP	0.30	0.019
MH 1998	Daniel Lee North	Fairgrounds	30	RCP	0.06	0.015
MH 2109	Walt. Clark 8"	Carlisle	8	VCP	0.29	0.012
MH 3575 W	Nickel	Madison	8	VCP	0.48	-
MH 2277	Tyler	Carlisle	8	VCP	0.68	0.006
MH 3574	Madison	Madison	8	VCP	0.68	-
MH 2715	Paloverde	Madison	8	VCP	0.81	0.018
MH 2271	8" at VanBuren	Carlisle	8	VCP	2.72	0.015
MH 1854	Split Rock	Carlisle	10	VCP	4.52	0.010
MH 1868	HP Farm	Carlisle	10	VCP	0.62	0.020
MH 1982	Barnes Park	Fairgrounds	15	VCP	0.58	0.019
MH 1866	RR South	Fairgrounds	15	VCP	0.30	0.010
MH 1920	Horse Pasture	Fairgrounds	15	VCP	0.63	0.037
MH 1930	Taft Interceptor	Fairgrounds	15	VCP	0.41	0.013
MH 2001	Daniel Lee South	Fairgrounds	24	VCP	0.16	0.019
MH 3587	Namaqua	WWTP	24	VCP	0.10	0.03
MH 3588	S.E. 8th	WWTP	32	CIPP	0.01	0.025
MH 3609	Old Boyd	WWTP	32	CIPP	0.07	0.007

When graphed in the histogram formats (see Appendix B), the statistical distribution of n-values can be seen more clearly. While we are currently working with a small number of sample points, we have data from four different types of sewer pipe; PVC, VCP, Cured-in-Place Pipe (CIPP) and RCP. The PVC pipe n-values are distributed around the typical textbook value of 0.013, with a few higher n-values that appear to be outliers. High roughness values can be caused by low flow conditions in larger pipes, or flatter pipe slopes that allow solids to accumulate in the pipe. We encountered both of these situations in the East Side Lift Station basin. Based on the data available, we used a value of 0.013 for PVC pipes in the model.

The VCP pipe roughness calculations are reasonably distributed around the textbook value of 0.015. Therefore, we modeled the VCP pipes with an n-value of 0.015. During the 2008 phase of the study flow monitors were placed in two CIPP lines and three RCP lines. Both pipe types were assigned an n-value of 0.013.

These assigned roughness values will be used until additional flow monitoring data can confirm the actual operating n-value. We recommend that this analysis be done with all the data after each project phase to increase the statistical sample size of each data set.

The Boyd Lake lift station forcemain was modeled with a Hazen-Williams C-value of 100, reflecting an older cast iron pipe in a wastewater application with tuberculation occurring inside the pipe. The Boedecker lift station forcemain is modeled with a C-value of 130 reflecting a PVC pipe that is inert to corrosion.

Summary graphs for each flow monitor site are provided in **Appendix C**, and show the flow rate for the entire record, unit day average, minimum and maximum, daily pattern of peaking factors, and Manning n-values for the entire record. It is our observation that when the Manning n-values fall within close proximity to textbook values, the flow measurement data is generally more accurate. The further from text book values, the less reliable the data appears to be. In this way, by combining both direct flow measurements and geometric data, the Manning n-value can act as an index of data quality. **Table 2** summarizes the data collected at each flow monitor location.

Construction of the Sewer Model

Ayres is using a GIS-based computer program called "H2O Map Sewer" to model the City's sewer system. The model structure of pipes and manholes was initially loaded by importing the City's GIS data of the sewer network into H2O Map. This provided the skeleton of the model which included pipe sizes, pipe lengths, manhole locations and some pipe inverts and rim elevations. However, the model cannot run unless each pipe in the simulation has been assigned both upstream and downstream inverts. Ayres therefore had to determine the elevations of the missing inverts. There were many tools used to determine the unknown invert data. Most often the data could be found in the City's record drawings. On occasion survey data was either available or obtained to fill in gaps of data. Once these two methods had been exhausted invert data was either interpolated between known points, or extrapolated past the last known invert, usually assuming a minimum slope (i.e., a slope of 0.4% for 8" pipe, 0.28% for 10" pipe, etc.). Ayres noted the source of all invert and rim elevation data in the model. The source fields were filled in with one of the following descriptions: the record drawing file name, "surveyed," "interpolated," or "extrapolated."

Table 2. Data Collected at Flow Monitor Location.									
FLOW MONITOR SITE INFO			Flow				I/I		
Site #	Name	Basin	Average Flow (gpm)	Peak Flow Observed (gpm)	Peaking Factor	Average Customer Flow (gpm)	Base Dry Infiltration Rate (gpm)	Additional Irrigation Flow (gpm)	Wet Weather Inflow (gpm)
MH 7144 N	Corvus	ESLS	498	2353	4.7	421	77*		20
MH 4597	RV Park	ESLS	16	166	10.4	16	0		
MH 4587	Carinos	ESLS	44	124	2.8	35	9	10	45
MH 6795	Piney River	ESLS	28	89	3.2	26	2		40
MH 6786	McWhinney	ESLS	180	400	2.2	164	16		
MH 6768	Hahns Peak	ESLS	77	275	3.6	75	2		
MH 8074	Promenade	ESLS	40	179	4.5	36	4		
MH 3654	D/S Manhole	Madison	79	240	3.0	58	21*		
MH 2715	Paloverde	Madison	11	54	4.9	11	0		
MH 1867	HP Farm	Carlisle	254	615	2.4	180	74*	75	40
MH 2277	Tyler	Carlisle	62	209	3.4	53	9		
MH 2271	8" at VanBuren	Carlisle	55	160	2.9	47	8		
MH 4866	Walt. Clark 15"	Carlisle	95	220	2.3	53	42		
MH 2109	Walt. Clark 8"	Carlisle	12	59	4.9	12	0		
MH 3958	WilsonJct-12"	Carlisle	49	380	7.8	49	0		
MH 3958	WilsonJct-8"	Carlisle	36	172	4.8	28	8		
MH 3930	Boedecker Field	Carlisle	45	180	4.0	35	10		
MH 4007	Elbert & 10th	Carlisle	16	181	11.3	11	5		
MH 4008	Elbert	Carlisle	21	87	4.1	16	5	5	
MH 5904	New Boyd	WWTP	1068	1627	1.5	902	452	139	No Data
MH 3609	Old Boyd	WWTP	630	1454	2.3	525	105	141	No Data
MH 3601	Boise	WWTP	641	1390	2.2	468	173	232	No Data
MH 3587	Namaqua	WWTP	662	956	1.4	383	279	140	No Data
MH 3588	S.E. 8th	WWTP	768	1634	2.1	605	163		No Data
MH 3578	South Side	WWTP	73	149	2.0	66	7		No Data
MH 5911	ESLS D/S	WWTP	255	422	1.7	234	21		No Data
MH 1998	Daniel Lee N.	Fairgrounds Park	1112	2339	2.1	708	404	208	136
MH 2001	Daniel Lee S.	Fairgrounds Park	537	1010	1.9	371	166	77	253
MH 1982	Barnes Park	Fairgrounds Park	511	850	1.7	324	187	98	158
MH 1866	RR South	Fairgrounds Park	378	816	2.2	248	130		
MH 1922	Dog Park	Fairgrounds Park	1184	2009	1.7	621	563	182	
MH 1920	Horse Pasture	Fairgrounds Park	679	1200	1.8	414	265	133	125
MH 1917	Namaqua Int.	Fairgrounds Park	496	1090	2.2	343	153	90	177
MH 1930	Taft Int.	Fairgrounds Park	137	310	2.3	108	29		110
*Infiltration value used for Base Infiltration distributed by Pipe Diameter-Length over upstream basin									

The model was loaded using water meter data from the City. Consistent with the City's water distribution model, we used the metered water data to establish the average flow for each customer, and applied the flow to the nearest sewer manhole to the water meter address. However, the water meter data was available only in total gallons measured per month, to the nearest 1000 gallons. As part of the water meter data import, the monthly water use was converted to an average flow in gallons per minute. The usage pattern for each customer was determined based on typical customer type for various geographic areas corresponding to the flow monitor locations. For example, commercial areas were assigned a flow pattern corresponding to the nearest similar commercial area flow monitor location so that the resulting diurnal pattern in the model matched the measured flow pattern in the field. Additional loads for infiltration were added based on the extent to which those loads were observed in the flow monitors.

Future Conditions Model

Future loads were added to the existing model to produce a Future Conditions model. The future loads were determined by looking at the planned zoning of the major undeveloped areas within the City's wastewater service area boundary. Then the area of each potential development was measured and a dwelling unit density was applied to each area based on the City's description of each land use consistent with the zoning planned for each area. A density of 2.5 people per dwelling unit was used based on current statistics within the City. Finally, a water usage rate of 100 gallons per day was applied to each future person to generate an average daily load to the sewer. These loads were added to the model at logical points and the future model was run. **Appendix D** contains documentation and the calculations that were used to determine the future loads. Hahn's Peak Drive may ultimately require a 30-inch pipe, but may not be needed at all if the entire area does not develop to the currently planned density.

The East Side Lift Station has many areas of potential development including along Highway 34, north of the Medical Center of the Rockies and east of Interstate 25. When the future loads are applied to the model two major trunk lines flow full; the 24-inch line in Hahn's Peak Drive and many of the 30-inch pipes heading toward the East Side Lift Station. A map of the full pipes is provided in Appendix D.

The Madison Basin is built out and no future loads were applied to it. Therefore, no growth related needs were identified.

The Carlisle Basin has developable land south of 14th Street SW and west of Taft Avenue. This area will flow by gravity to the 18-inch line that has been stubbed underneath 14th Street west of Taft Avenue. When the future loads are applied, the entire 10-inch line between Taft Ave. and Roosevelt Ave flows full. A 15-inch PVC pipe, at the same grade as the existing line, would be able to convey the future flow at ¾ full. Constructing this pipe in parallel would minimize disruption to existing flow and provide a redundant line through the Ryan's Gulch/HP Farm area.

Conclusions and Recommendations

With regard to the overall collection system studied during this phase, we have observed minor amounts of infiltration due to either prevailing groundwater levels or the influence of a nearby ditch. Overall infiltration in the East Side Lift Station basin was calculated to be 488 gallons per day per inch-diameter mile of pipe. The Madison Basin was found to be 823 gallons per day per inch-diameter mile. The Carlisle basin was found to be 477 gallons per day per inch-diameter mile. This data is reasonable for the older Madison and Carlisle Basins compared to a benchmark of 200 gpd/in-mile for new and tightly jointed systems. The ESLS basin is higher than expected for a relatively new system, though not unreasonable for collection systems in general. However, we have not identified any locations where the infiltration is significant enough to warrant repair for hydraulic reasons. (Evaluation of structural condition is completed by the City through their pipe camera inspection work.)

Prior to the 2008 flow monitoring effort, we had not seen evidence of direct inflow to the wastewater collection system and only very limited rainfall derived infiltration response in a few areas. This indicates that under the relatively dry ground conditions and lower precipitation patterns during the flow monitoring effort, the portion of the collection system studied is not significantly impacted by wet weather flows. Extended duration storms, higher levels of antecedent soil moisture conditions and more intense rainfall may reveal greater susceptibility to inflow and infiltration. However, on September 11th, 2008 a thunderstorm dropped over an inch of rain and significant inflow was seen in the lines coming into Fairgrounds Park. Graphs depicting inflow are provided in Appendix C.

The following conclusions were made to the specific questions identified for each basin. For the East Side Lift Station basin, no short-term hydraulic capacity limitations were identified. Significant additional flow may be added to the existing pipe network without causing hydraulic capacity issues. However, due to oversized pipes and flatter pipe slopes, upper pipe reaches are experiencing septicity problems and deposition of solids. These environments were typically found to be quite corrosive to equipment, but most of the manholes are fairly new and in good condition. Flows from the Promenade Shops at Centerra were found to peak at 175 gpm on October 27, 2007 compared to a design capacity at 75% full of 852 gpm. At this peak flow, the 24" pipe under Interstate-25 was 16% full based on depth.

For the Madison Avenue basin, while the pipe diameters are small compared to the tributary area, pipe capacity was not identified as an issue that would lead to the history of backups. In fact, existing condition flow loads do not cause pipe full ratios above 0.4 d/D. However, significant grease accumulation was identified in this area that requires regular (i.e., monthly) jetting to keep the lines clear. This basin is nearly built-out, therefore additional customer flow is not anticipated. We do recommend, however, that the industrial pretreatment program be extended to existing commercial establishments as well as to redevelopment or new development. Without the grease interceptors required by the pretreatment program, existing restaurants will continue to dispose of fats, oils and greases into the wastewater collection system, causing additional maintenance burden and risk of backup to the City.

For the Carlisle basin, the City has scheduled a capital improvement project to construct a parallel sewer along the 10" Carlisle line from Taft Avenue to Railroad Avenue. This project was based on an assumed capacity bottleneck that has led to apparent surcharges in the manholes. The flow monitoring conducted in this critical line from 10/4/07 to 1/8/08 and 3/28/08 to 7/1/08 captured a peak discharge of 615 gpm and 7.2" of depth which represents approximately 72% full in the pipe monitored based on depth. This was a single event. The next highest flows recorded were two events at approximately 550 gpm, then 4 events at 530 gpm. When we use the flows captured by the flow monitors and apply those flows to the entire tributary area, we have determined that a stretch of pipe in between our two flow monitor locations is susceptible to full-flow conditions under dry weather load conditions (see **Appendix E**). This reach of pipe is approximately 1873 feet long, and runs from the bottom of the hill at Split Rock Drive / Carlisle at Taft Avenue to about mid-way to Railroad Avenue. Based on these flows, we agree that it is time to begin planning a parallel pipe replacement for the existing 10" line, along with regular inspections of the line for debris or potential backups. Portions of this 10" pipe do not have adequate margin for handling debris or grease plugging. However, at the present time this pipe appears to be staying clear and not experiencing flow spikes that are significantly beyond the pipe capacity. Therefore, we recommend that the 10" Carlisle pipe from Taft Avenue to Railroad Avenue continued to be listed on the 5-Year Capital Improvement Plan, and be designed and built as soon as practical. Postponing the construction of this capacity improvement until additional growth occurs in the Carlisle Basin will increase the City's risk of a large scale backup and potential sewer overflow into the agricultural area and Ryans Gulch drainage.

The data collection for the Fairgrounds Park and WWTP Trunks took place between 8/26/08 and 2/25/09. The goal for investigating these two areas was to develop the trunk line portion of the model to allow further investigation of any wastewater basin, while at the same time supporting the organic sampling effort. This limited the basin specific conclusions, but provided a comprehensive picture of the system wide flows and infiltration components

During the course of our investigation, we have identified a significant number of deteriorated manholes in need of structural repair. We recommend that these manholes be rebuilt promptly and restored to adequate structural and leak-free condition. Specific manholes are listed in Appendix B. In addition, for any future pipe rehabilitation projects, we strongly recommend that manhole rehabilitation be included in the work, even if it means a reduced length of pipe rehabilitated.

APPENDIX

City of Loveland: 2007 Wastewater Report

Appendix Contents

- Project Scope
- Equipment Bid and Purchase
- East Side Lift Station Basin: Manhole Sketches
- Madison Basin: Manhole Sketches
- Carlisle Basin: Manhole Sketches.
- Monitoring Logs
- East Side Lift Station Basing: Flow Data
- Madison Basin: Flow Data
- Carlisle Basin: Flow Data
- Rainfall-derived I/I Data
- Model Results

Project Scope

CITY OF LOVELAND - WASTEWATER MODELING 2007
FLOW MONITOR PURCHASE AND
COLLECTION SYSTEM FOCUS AREAS #1, 2, AND 3

PROJECT OBJECTIVES

1. To evaluate and recommend a quantity and manufacturers model of wastewater pipe flow monitors for ongoing use by the City of Loveland.
2. To recommend and implement a flow monitoring program to gather actual data on system flows and use this data to characterize the flow rates and patterns in the City collection system.
3. To develop a calibrated hydraulic model of the City of Loveland Wastewater Collection System for use by the City in operating, maintaining, and expanding the collection system in an efficient manner. Specifically, the model will assess existing capacity, flows, and available capacity to serve additional growth. Where parallel or replacement pipes are required, pipe size will be recommended based on future loads.
4. To provide optimized recommendations to the City for capital construction projects that will increase the capacity of specific segments of the system at the least cost.

GENERAL

Ayres Associates (Ayres) will provide professional engineering and land surveying services, including development of a wastewater collection system hydraulic model, data collection and entry, hydraulic analysis, capacity improvement alternative analysis, and documentation of the model and the results of the analysis.

Three different Collection System Focus Areas will be studied under this contract. The approximate boundary of each Focus Area is shown on the attached Vicinity Maps. Collection System Focus Area #1 includes the area tributary to the City's Eastside Lift Station at 1st and Sculptor. This includes the Centerra area generally from the Boyd Lake Outlet Ditch to I-25, along with the Mountain View and Interchange Lift Stations. The northern limit will be the City's wastewater service area, and the southern limit will be the Eastside Lift Station. Development east of I-25, including the Shops at Centerra and Grand Station will be provided by others and incorporated into the model as a distributed load on the collection system east of I-25. This basin is a priority for hydraulic study in anticipation of the Grand Station development coming on-line in late 2008.

Focus Area #2 includes the area from Silver Lake south to the Great Western Railroad, generally along Madison Avenue. This relatively small area is responsible for a chronic capacity bottleneck that has resulted in claims against the City for wastewater backups.

Focus Area #3 includes the area tributary to the existing 10" sewer at Taft Avenue and Carlisle Drive. Observations of City staff indicate a chronic surcharging condition in the line between Taft and Railroad Avenues. The specific causes of the surcharging may include limiting pipe

size, hydraulic backwater conditions from downstream, or poor operation of the flow split at Wilson Avenue and Carlisle Drive.

The City has the following data available, which will be used to the greatest extent possible:

- Previous Wastewater Collection System Modeling Reports for Focus Area #1 by Sear-Brown / Stantec and RTW
- GIS node and link data for the wastewater system, including pipe length, diameter, material, and horizontal location
- Record drawings of the sewer construction available electronically through the City's archives
- Lift station SCADA data including pump run times. Flow measurement may or may not be included, depending on the lift station.
- Work order records for line plugging, backups, and condition reports for sewer in the study areas
- TV inspection videos for the study areas

Specific details of the extent of work are described below.

TASK 1 – Flow Monitor Purchase

Ayres will recommend to the City a program for purchasing flow monitors for ongoing use related to wastewater modeling, including a recommended number of monitors and a recommended model. Our recommendation will be based on up-to-date manufacturer information, cost, capability of the monitor, and supporting software. Short-term rentals may be available from Ayres or other flow monitor vendors. Full service data delivery packages may be available as well and will be considered to supplement the City's flow monitoring effort. The full service packages may include the option of web-based data delivery, which would reduce the time required for staff to be out in traffic. Typically, purchasing monitors is more cost-effective for a total use longer than 4 to 6 months. These monitors can be reconfigured for various pipe sizes and re-deployed to other areas in the City for ongoing use. Costs for flow monitor recommendations and product analysis under this task are a one-time event and will not be required for future study areas within the collection system. We request that the City purchase the flow monitors directly to benefit from the manufacturers support and warranty. New monitors are anticipated to cost approximately $4,500 each, including adjustable pipe rings, sensor, data collector, and a shared downloading and analysis software.

TASK 2, 3, and 4 – Focus Areas #1, 2, and 3

The same work will be completed for each focus area. Budgets have been developed separately to reflect the relative size and complexity of each Focus Area. Meetings will be combined for all three focus areas wherever possible for consistency in how the model is developed in each basin.

2.1 Flow Monitoring Program and Field Installation

Ayres will develop a program of flow monitoring activities to help the City collect the data required to calibrate the wastewater collection system model. This will include a map of desired flow monitor locations and a data archiving system to keep track of the data that is collected over time. Flow monitors require an initial installation, follow-up check after the first week, then

interim data collection for approximately 3 months, when a battery change or redeployment may be required.

Ayres will also provide installation and data collection assistance to the City as the monitors are installed and at data collection intervals thereafter up to three months per monitor per location. We request that the City provide a crew equipped for sewer manhole entry and the replacement batteries required for the monitors after the initial batteries wear out. (Initial batteries typically come with the purchase of the monitors.)

2.2 Flow Data Analysis

Once data is collected from the flow monitors, Ayres will analyze the data with the following objectives:

- Identify flow components (constant and seasonal infiltration, customer flow, storm inflow)
- Calculate actual operating n-values for various pipe types
- Develop characteristic diurnal curves for residential, restaurant, commercial, and institutional users.
- Calculate average flow per tap for various types of customers

One meeting with the City is anticipated to present the results of the flow monitoring effort for all three focus areas.

2.3 Construct the Model Structure – Pipe and Manhole Locations:

Using current City of Loveland GIS Data, the structural components of the model will be assembled and checked for flow direction and appropriate connections in sewer modeling program H2O Map Sewer by MWHSoft. According to Jill Fischer, network topology (connections between pipes and manholes, and flow direction) is already in place, so minimal effort is expected in this step. Ayres staff will work with City GIS staff to collect the appropriate system data and transfer it to the hydraulic model.

2.4 Construct the Model Structure – Pipe Inverts:

City GIS data for the wastewater collection system does not typically include invert information. For Focus Areas #1, 2, and 3, invert data has not been entered into the GIS. Some invert data may be available in previous modeling efforts. Where available, it should be checked against City record drawings. If not available, record drawings would be the best source of data. If City record drawings are not available, inverts can either be estimated between known points (for small gaps in data) or surveyed in the field (for more extensive pieces of missing data). A limited amount of survey time for each Focus Area has been included to confirm record drawing data. Ayres proposes to build the hydraulic model on a laptop computer that we can bring to the Service Center and use side-by-side with a City computer. We will pull up record drawings on the City computer and enter the data directly to the laptop. This will save City staff time in collecting and printing record drawings and allow Ayres to track within the model which set of record drawings the data came from. Ayres typically creates custom data fields in the model to track where the invert information came from. Both upstream and downstream inverts will have this info. We have found that this prevents a lot of re-work in the future, especially for field crews, if we document the source of the data when it is first entered.

If invert data is found to be inconsistent or missing, a more extensive survey effort can be initiated under Task 5 – Supplemental Field Survey.

2.5 Pipe Roughness:

In the absence of flow monitoring data, an initial estimate of Manning's n-value will be made for each type of pipe based on manufacturer's recommendations. We have found these recommendations to be quite conservative, but actual flow conditions need to be observed before a lower roughness value can be justified. Once flow monitoring data is available, Manning's n-values will be adjusted accordingly.

2.6 Calibration and Flow Loading Scenarios

This task requires the most effort and involves collecting and distributing the actual wastewater loads over the various nodes in the system. Water meter data can be used in conjunction with the City GIS to assign winter quarter water use to the nearest sewer manhole. Key accounts are typically handled individually, along with the top 10 to 50 water users, depending on the basin. This helps ensure that the most significant impacts to the sewer loads (i.e., Medical Center of the Rockies) are addressed individually and not averaged over several connection points or assigned to the wrong line. Sewer flows will be broken out into several components to identify flows by source. Customer flows will be broken out by user type – residential, commercial, restaurant, and institutional. Each type of use will have a unique diurnal peaking pattern applied to reflect the daily cycle of wastewater generation. We expect that the timing of peak flows may be different between residential and other uses. In addition to customer flow, there may be infiltration base flow (constant time base), seasonal infiltration flow (monthly time base), rainfall derived infiltration – "RDI" (daily time base), and storm inflow (minute time base). These various components of flow can then be combined to create flow scenarios representing dry weather, typical summertime flows, wet weather flows, and storm event potential flows. Without a history of flow monitoring in wet weather, the rainfall derived infiltration and storm inflow components can be very difficult to estimate. We will indicate to the City the level of certainty we have with these weather induced flows. Lift station and wastewater plant records may provide some indication of peak flow potential for this area. Calibration results will be presented to the City in a project meeting.

As indicated by the City, the Shops at Centerra and the Grand Station areas east of I-25 will be modeled separately by the developers of those properties. Flow from these areas will be input to the City's model at the respective sewer pipes east of I-25. We request that the off-site flow analysis be completed in the same H2O Map Sewer / Info Sewer program, so that the results can be easily incorporated into the City's model. We also request itemization of the non-customer flows (infiltration and inflow), lift station parameters, and the peaking methods and factors assumed for those flows. Ayres will provide review of the model prepared by others, itemized comments, and one coordination meeting with the developer to convey the review comments.

Future flows will be added to the model based on the ultimate service area 208 Boundary for the City of Loveland, with land uses and density applied per the Comprehensive Plan. Where possible, future loads will be distributed according to outfall location, however because the future systems are not yet built, the loads often end up as point loads at the perimeter of the existing collection system.

2.7 Scenario Analysis

Once the model structure is complete and the flows have been added to the model, the model can be used as an analysis tool to evaluate capacity and alternatives solutions to increase capacity. For example, in Focus Area #1 several bottleneck locations exist along Rocky Mountain Avenue, along with parallel pipes that may have additional capacity. In Focus Area #3, the size of a potential parallel pipe to the Carlisle Sewer can be determined and compared to the first portion of that line, which has been designed previously. The model can assist in determining which connections or expansions will provide a benefit to the overall system capacity. Ayres will prepare tables of pipes with current or future flows greater than 80% of full capacity under various flow scenarios. We will also provide recommendations for capital projects that will provide an affirmative benefit / cost ratio to increase system capacity. Two meetings with City staff are anticipated related to modeling scenarios.

2.8 Documentation

At the completion of this work, Ayres will formally transfer the hydraulic model to the City for the City's use. However, at any time in the process of developing the model, the City is welcome to a working copy of the model. The model itself will be a major piece of documentation of the analysis performed, as it contains all the flows, patterns and hydraulic data. Ayres will provide the City with a modelers notebook detailing various decision steps made as the model was developed. We will also provide summary technical memoranda for the various queries and analyses performed. It is anticipated that as additional sections of the City are modeled, these technical memoranda can be combined into an updated Wastewater Master Plan.

TASK 5 – Supplemental Field Survey

If needed, Ayres Associates can provide field survey of the wastewater collection system. We recommend that if a crew is mobilized to a particular area, that they shoot rim elevations on all the wastewater manholes that they can find. Once the rims are recorded by City manhole number, inverts can be obtained at a later date. If cost containment is desired, we recommend dipping inverts on alternate or third manholes instead of skipping rim elevations. In addition, we have developed a manhole questionnaire form to document the condition and material of the manhole, size and type of pipes, a sketch of flow directions, and other relevant data. This information and site photos can be linked to the manhole location for future use in the GIS or CityWorks system. We have budgeted up to two weeks of survey time, if required.

Billing and Rates

The proposed work will be completed on a time and material basis, not to exceed $140,407, according to Ayres Associates Inc 2007 Professional Services Rate Schedule, which is attached. A breakdown of work effort and anticipated fees is attached. Monthly invoices will be submitted to the City of Loveland.

Schedule

Flow monitor selection and purchase order by July 2
Flow monitor delivery by August 17
Installation ASAP
Flow monitoring data collection – end of August through October
Model construction – July through October
Model loading (preliminary) - August
Flow monitor analysis – October to November
Model calibration – November
Analysis and conclusions – December
Technical memoranda – January 2008

Equipment Bid and Purchase

City of Loveland
Wastewater Flow Monitors

The City of Loveland desires to purchase an assortment of in-pipe open channel sewer flow monitors, according to the performance requirements listed below. A schedule of quantities for each item follows.

Sensor Type A: Standard Area-Velocity Flow Sensor – capable of measuring full-pipe velocity and surcharged depth
Sensor Type B: Ultrasonic Depth Measurement and Velocity Flow Sensor – capable of measuring low flows
Sensor Type RG: Rain Gauge capable of measuring rainfall at 15 minute intervals at a precision of 0.01 inch

Data Collector Type 1: Single Sensor Recording Capability (any one of Sensor Type A, B or RG)

Data Collector Type 2: Dual Sensor Recording Capability (any two of Sensor Type A, B or RG)

Data Collector Type 3: Triple Sensor Recording Capability (any combination of Sensor Type A, B or RG)

Each Data Collector shall meet the following minimum requirements:

1) Self contained power with minimum Battery life of 90 days with data sampled at 15 minute intervals, downloaded once a week.
2) Minimum Data Storage Memory of 90 days.
3) Sealed units to withstand complete submergence in a surcharged manhole.
4) User selectable recording interval, with capability to increase the frequency of measurements during high flow events.
5) Capability for data download via cable to Personal Computer.

Download Cables: Min. 10 foot long cable to connect data collector to personal computer

Processing Software: Software shall configure and poll data from data collector, allow data processing of monitor data, and export to Microsoft Access or Comma Separated Value data formats.

Schedule of Quantities:

Item	Description	Quantity
1	Sensor Type A - Standard Area-Velocity Sensor	16
2	Sensor Type B - Ultrasonic Depth and Velocity Sensor	2
3	Sensor Type RG - Rain Gauge	4
4	Data Collector Type 1	7
5	Data Collector Type 2	6

6	Data Collector Type 3	1
7	8" Pipe Installation Hardware	4
8	10" Pipe Installation Hardware	5
9	12" Pipe Installation Hardware	1
10	15" Pipe Installation Hardware	1
11	18" Pipe Installation Hardware	1
12	24" Pipe Installation Hardware	4
13	30" Pipe Installation Hardware	1
14	36" Pipe Installation Hardware	1
15	Data Collector Installation Hardware	14
16	Download Cables	2
17	Processing Software	2

AYRES ASSOCIATES

August 21, 2007

Chris Matkins, PE
Civil Engineer
City of Loveland, Department of Water & Power
200 N. Wilson Avenue
Loveland, CO 80537

Re: Wastewater Flow Monitoring Equipment Procurement

Dear Chris:

Ayres Associates Inc has evaluated the bids presented on August 16, 2007 for the City of Loveland Wastewater Flow Monitoring Equipment Procurement. Our evaluation is intended to verify that each bid meets the City's requirements as published in the Invitation to Bid. Ayres Associates will provide a recommendation as to which bid best addresses the City's objectives for wastewater flow monitoring.

The attached table documents the monitor capabilities submitted with each bid, and deviations from the City requirements. In summary, bids were received from $41,389.99 to $108,610.20, but not all of the bids met the specifications outlined in the Invitation to Bid. Our recommendation will be for the second lowest bidder, Teledyne ISCO c/o TDMA at $59,078.72, for the reasons described below.

We recommend considering the apparent low bidder, ADS Environmental "Used ISCO Equipment", as a non-conforming bid for the following reasons.

1. No product data was provided for the rain gauges to verify sensitivity, data storage and battery life.
2. No references were provided.
3. The 90 day warranty provided was substandard compared to the other bids which were typically a 12 month warranty. Also, it was unclear how the warranty would be administered, considering that the proposed products were manufactured by a vendor other than the proposer.
4. The City's intent with this Invitation to Bid was to purchase new equipment.

We recommend proceeding to the second lowest bidder, Teledyne Isco c/o TDMA, with a conforming bid at $59,078.72. We have contacted several of the references provided, and heard similar positive reports to our own personal experience with the ISCO products, local representatives, and customer service. No outstanding issues were revealed in the reference check, and the references were pleased with the Isco product and recommended their continued use.

Therefore, we recommend award of this bid for Wastewater Flow Monitors to Teledyne Isco c/o TDMA for the amount of $59,078.72. Time is of the essence to get the flow monitors installed.

Notification of the award to Teledyne Isco c/o TDMA will trigger a 14 day delivery timeframe, after which Ayres Associates and the City of Loveland will get the meters installed and begin data collection.

Sincerely,

Owen Ayres & Associates, Inc.

Christopher G. Pletcher, PE
Project Manager

Enclosure

City of Loveland

Department of Water and Power

Service Center • 200 North Wilson Avenue • Loveland, CO 80537
(970)962-3000 • FAX (970)962-3400 • TDD (970)962-2620

August 16, 2007 Wastewater Flow Monitoring Equipment Procurement

Bidder:	Bid Price	New / Used	Sensor Mfr / Model	# Std A/V Sensors	# Ultra-sonics	# Rain Gages	Flow Logger Battery Life	Rain Gauge Battery Life	Meets 90-Day Data Storage	References Provided	Warranty	2 Data Cables	2 Software Licenses	Bid Conforms	Reason
ADS Env. - Alt. #1	$41,389.99	Used	ISCO 2150/2110	16	2	4	1 Year +	unknown	Yes	No	90 Day	Yes	Yes	No	Used Equipment, unknown rain gage model / capability / battery life, no references, Substandard Warranty Compared to Others
Teledyne Isco c/o TDMA	$59,078.72	New	ISCO 2150/2110	16	2	4	1 Year +	6 Months	Yes	Yes	18 Months	Yes	Yes	Yes	
ADS Env. - Alt. #3	$60,809.04	Used (Refurb.)	ADS 1502EM	16	2	4	12 Months	same	Yes	No	12 Months	Yes	Yes	No	References Not Provided
Pfister and Associates	$62,420.00	New	Greyline Stingray	0	18	4	24 Months	24 Months	Yes	No	12 Months	Yes	Yes	No	References Not Provided
Hach Company	$63,972.29	New	Sigma 910/920/930	15	1	4 (Rental)	Yes*	Yes*	Yes	No	12 Months	Yes	Yes	No	Sensor Quantities Do Not Meet Requirements, Rental of Rain Gauges, References Not Provided
Hach Company	$69,325.47	New	Sigma 910/920/930	16	2	4	Yes*	Yes*	Yes	No	12 Months	No	Yes	No	Missing 1 Data Cable, References Not Provided
ADS Env. - Alt. #2	$108,610.20	New	ADS FlowShark 5000 AS/BS	16	2	4	18 Months	same	Yes	No	12 Months	Yes	Yes	No	References Not Provided

East Side Lift Station Basin: Manhole Sketches

East Side Lift Station Basin

Legend

SManhole
- <all other values>

SUBTYPE
- SDropManhole
- SSplitManhole
- SStandardManhole

Wastewater

Pipe Diameter
- 4"
- 6"
- 8"
- 10"
- 12"
- 13"-CIPP
- 15"
- 16"
- 18"
- 21"
- 22"-CIPP
- 24"
- 27"
- 29" CIPP
- 30"
- 32" CIPP
- 33"
- 36"
- 8"- Proposed
- 10"- Proposed
- 15"- Proposed
- 12"- Proposed
- 21"- Proposed
- 30"- Proposed

Force Mains
- Active
- Proposed
- Private
- Lift Station

Basin Boundary

1"=600'

0 0.25 0.5 0.75 1 Miles

BOYD LAKE

BOYD LAKE PRIVATE LIFT STA.

BOYD LAKE LIFT STA.

HEINRICY LAKE

WESTERDOLL LAKE

UPPER HOFFMAN

LOWER HOFFMAN LAKE

LAKES PLACE LIFT STA.

HOUTS RESERVOIR

EQUALIZER LAKE

MOUNTAIN VIEW LIFT STA.

EASTSIDE LIFT STA.

FUTURE LIFT STA.

GREAT WESTERN RR

1. CAMBRIDGE CT
2. WINCHESTER CT
3. CANTERBURY CT
4. ABBEY CT
5. MARKHAM CT
6. SALISBURY CT
7. HYDE CT
8. KENNINGTON CT
9. WELLINGTON CT
10. SUSSEX CT
11. KENT CT
12. WIMBLEY CT
13. MANCHESTER CT
14. NOTTING HILL PL
15. SNOWY RANGE CT. (PR)

1. PLUM CREEK DR
2. BUFFALO MTN. DR
3. BEAR CREEK PL
4. SHAVANO PL
5. MAROON CREEK PL
6. HARVARD PL
7. PINEY RIVER DR
8. INDEPENDENCE DR
9. BIG SANDY PL
10. HALFMOON CR
11. TEMPLE GULCH CIR
12. MONARCH CR
13. LOST CANYON DR
14. LOST CREEK DR

1. KERMESITE PL
2. KERMESITE CT
3. RUBY AVE
4. ZINC AVE
5. CINNABAR CT
6. PYRITE CT
7. ATACAMITE CT
8. SODALITE CT
9. EMERALD CT
10. GYPSUM CT
11. KRYPTON CT
12. AUGITE PL
13. OPAL PL
14. OPAL CT
15. ANGON PL
16. SELENIUM CT
17. TUNGSTEN CT
18. CALCITE CT

MH 8063 - N. and E Rocky Mtn. Ave.

MH 8074 Promenade

MH 6768 Hahns Peak

MH 6795 Piney River

MH 6786 McWhinney

MH 4597 RV Park

MH 4587 Carinos

MH 6252 Mountain Lion

MH 7144 N and W Corvus

COUNTY ROAD NO. 26 / CROSSROADS BLVD

CROSSROADS BLVD

E COUNTY ROAD NO. 24

COUNTY ROAD NO. 20E

E EISENHOWER BLVD

E 37th ST

E 15TH ST

E FIRST ST

N BOYD LAKE AVE

ROCKY MOUNTAIN AVE

MCWHINNEY BLVD

CLYDESDALE PARKWAY

DRAFT HORSE DR

ST. CLOUD DR

POWELL ST

SHERMAN ST

MACMURRAY AVE

KENDALL PKWY

CENTERRA PKWY

SKY POND DR

FOXTRAIL DR

CREEK

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Prepared April 16, 2007
File: Wastewater30x42.mxd

AYRES ASSOCIATES

Sewer Manhole Field Data

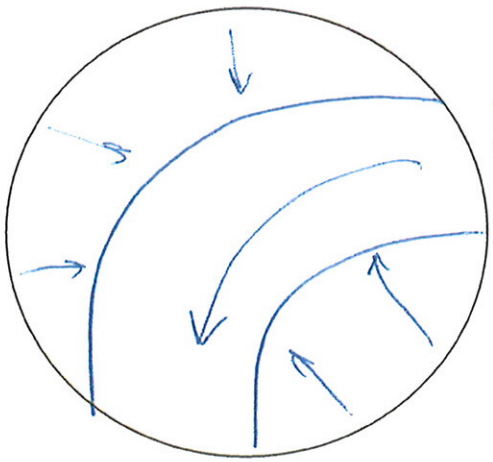
MH ID: 8074 **Location:** I-25 Crossing from Shops at Centaerra

Material: (Concrete) Brick Liner/Insert _____

Condition: Like New (Good) Moderate Poor Collapsed

Street: _____

10/12 Ink download
MH wet / Condensation
appears to be dirt / mud on bench
rain gauge undisturbed
10/31 Take ultrasonic sensor off



Street: _____

Show:
Pipes
Flow Direction
Invert Benching

RIM Elev.:				
Heading:				
Drop:				
Diameter:				
Pipe Material:				
Flow IN / OUT				
Invert:				

Proj. No.:	32-1257.00	Remarks	MH in East Side Lift Station Basin	Prepared by	Date
Proj. Name:	**Loveland WW Model**			Checked by	Date
Title/Item:					Sheet of

AYRES ASSOCIATES

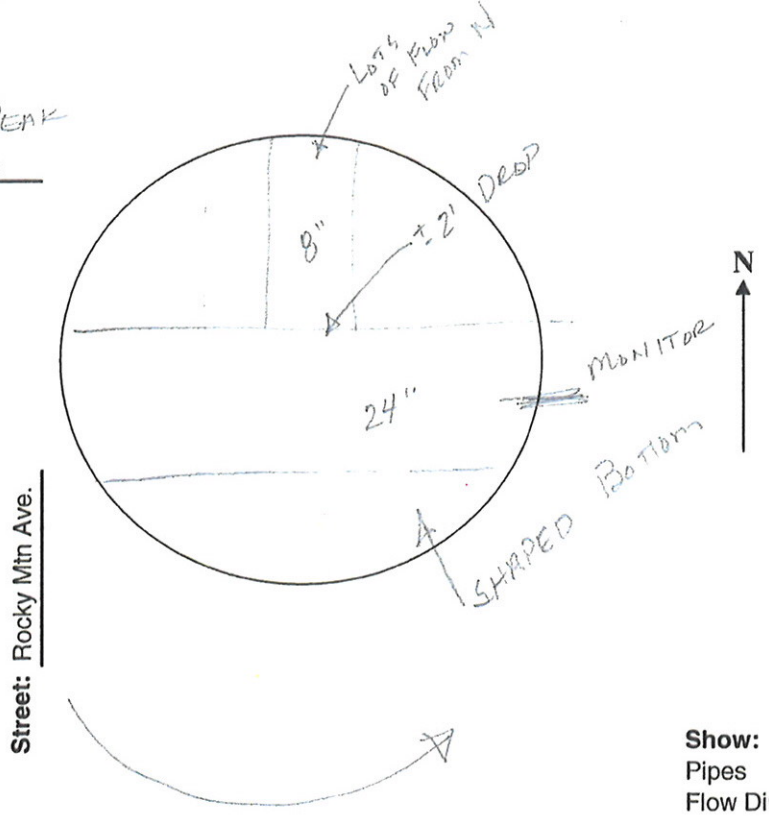
Sewer Manhole Field Data

MH ID: ~~8063~~ → U10 **Location:** Rocky Mtn. Ave. @ Equalizer Outlet Ditch

Material: Concrete Brick Liner/Insert PVC

Condition: Like New (Good) Moderate Poor Collapsed

Street: Hahn's Peak Equalizer Ditch



Show:
Pipes
Flow Direction
Invert Benching

RIM Elev.:				
Heading:				
Drop:				
Diameter:				
Pipe Material:				
Flow IN / OUT				
Invert:				

Proj. No.:	32-1257.00	Remarks	MH in East Side Lift Station Basin	Prepared by	Date
Proj. Name:	**Loveland WW Model**			Checked by	Date
Title/Item:					Sheet of

AYRES ASSOCIATES

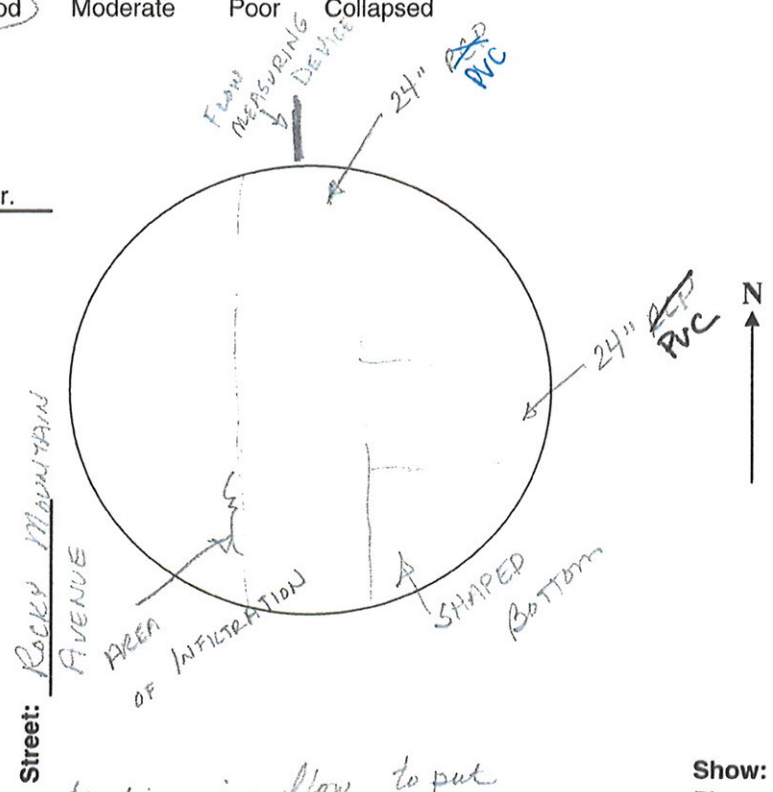
Sewer Manhole Field Data

MH ID: ~~6768~~ 8063 **Location:** Hahns Peak Drive west of Rocky Mtn Ave.

Material: Concrete Brick Liner/Insert _____

Condition: Like New (Good) Moderate Poor Collapsed

Street: Hahns Peak Dr.



Note! Installer is standing in flow to put monitor in

Show:
Pipes
Flow Direction
Invert Benching

RIM Elev.:				
Heading:				
Drop:				
Diameter:				
Pipe Material:				
Flow IN / OUT				
Invert:				

Proj. No.:	32-1257.00	Remarks	MH in East Side Lift Station Basin	Prepared by	Date
Proj. Name:	**Loveland WW Model**			Checked by	Date
Title/Item:					Sheet of

AYRES ASSOCIATES

Sewer Manhole Field Data

MH ID: 4587 **Location:** Carino's Restaurant (MH in Parking Lot)

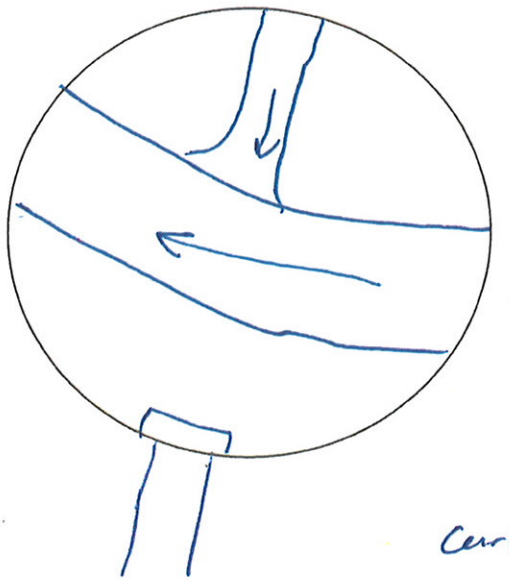
Material: (Concrete) Brick Liner/Insert _____

Condition: Like New (Good) Moderate Poor Collapsed

Target

Street: _____

10/12 1 wk download
MH dry, no debris noted



Show:
Pipes
Flow Direction
Invert Benching

RIM Elev.:	4942.28			
Heading:				
Drop:				
Diameter:				
Pipe Material:				
Flow IN / OUT				
Invert:				

Proj. No.:	32-1257.00	Remarks	MH in East Side Lift Station Basin	Prepared by	Date
Proj. Name:	**Loveland WW Model**			Checked by	Date
Title/Item:					Sheet of

AYRES ASSOCIATES

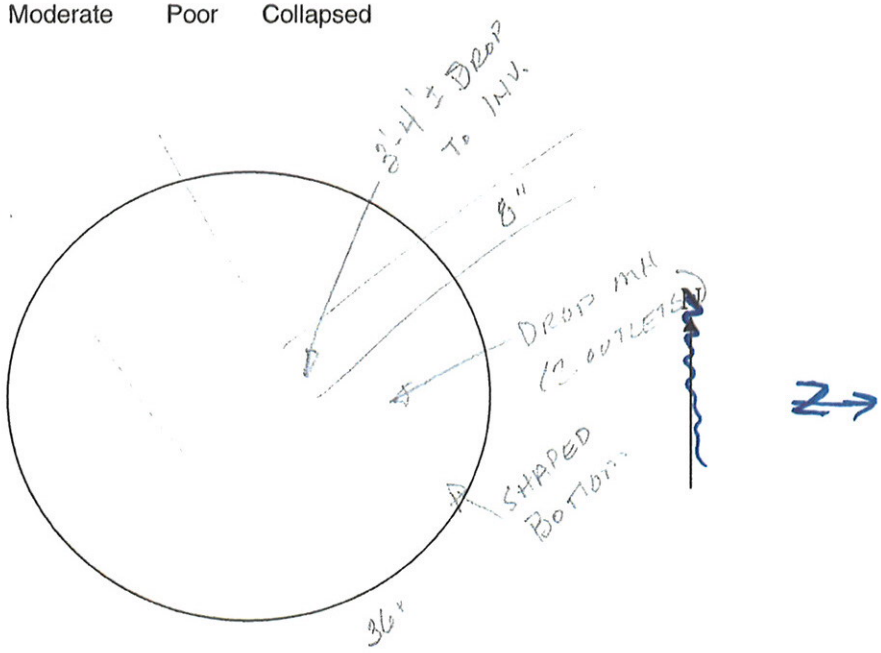
Sewer Manhole Field Data

MH ID: 6786 **Location:** Piney River Dr. and McWhinney Blvd

Material: Concrete Brick Liner/Insert _____

Condition: Like New Good Moderate Poor Collapsed

Street: ~~Piney River Drive~~



Street: ~~McWhinney Blvd.~~

NOTE: Not enough cable to pull box out of mH

Show:
Pipes
Flow Direction
Invert Benching

RIM Elev.:				
Heading:				
Drop:				
Diameter:				
Pipe Material:				
Flow IN / OUT				
Invert:				

Proj. No.:	32-1257.00	Remarks	MH in East Side Lift Station Basin	Prepared by	Date
Proj. Name:	**Loveland WW Model**			Checked by	Date
Title/Item:					Sheet of

AYRES ASSOCIATES

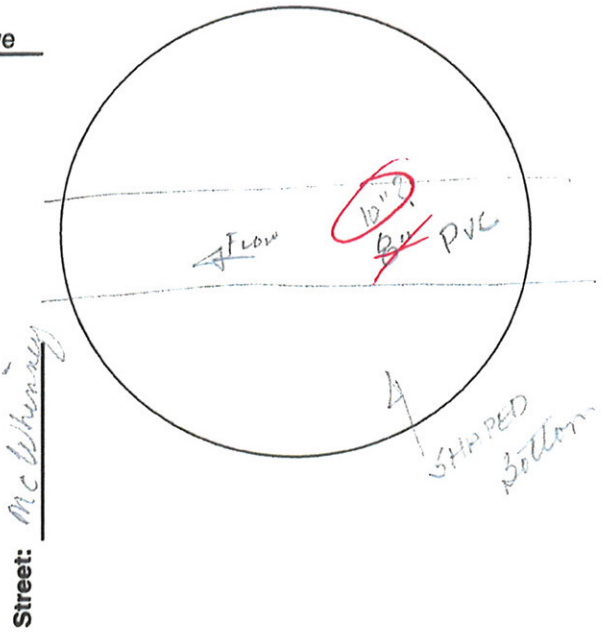
Sewer Manhole Field Data

MH ID: 6795 **Location:** Piney River Dr

Material: Concrete Brick Liner/Insert _____

Condition: Like New Good Moderate Poor Collapsed

Street: Piney River Drive



N

Show:
Pipes
Flow Direction
Invert Benching

RIM Elev.: _____

Heading:	_____	_____	_____	_____
Drop:	_____	_____	_____	_____
Diameter:	_____	_____	_____	_____
Pipe Material:	_____	_____	_____	_____
Flow IN / OUT	_____	_____	_____	_____
Invert:	_____	_____	_____	_____

Proj. No.: 32-1257.00	Remarks MH in East Side Lift Station Basin	Prepared by	Date
Proj. Name: **Loveland WW Model**		Checked by	Date
Title/Item:			Sheet of

AYRES ASSOCIATES

Sewer Manhole Field Data

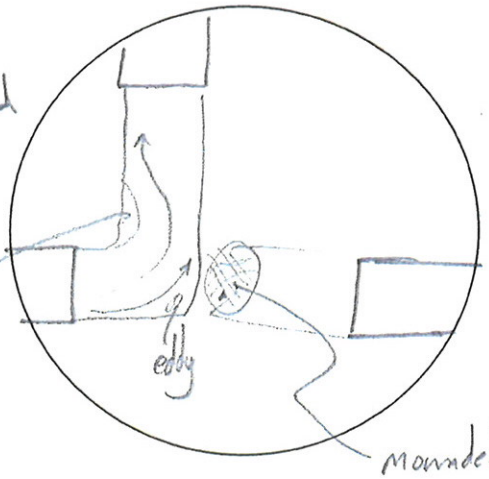
MH ID: 4597 **Location:** Boyde Lake Ave. line at Campground

Material: (Concrete) Brick Liner/Insert

Condition: Like New (Good) Moderate Poor Collapsed

Street: E. Eisenhower Blvd.

10/12/07 1-wk download
- Dry
- metal rim corroding



Show:
Pipes
Flow Direction
Invert Benching

RIM Elev.:				
Heading:				
Drop:				
Diameter:				
Pipe Material:				
Flow IN / OUT				
Invert:				

Proj. No.: 32-1257.00	Remarks MH in East Side Lift Station Basin	Prepared by	Date
Proj. Name: **Loveland WW Model**		Checked by	Date
Title/Item:			Sheet of

AYRES ASSOCIATES

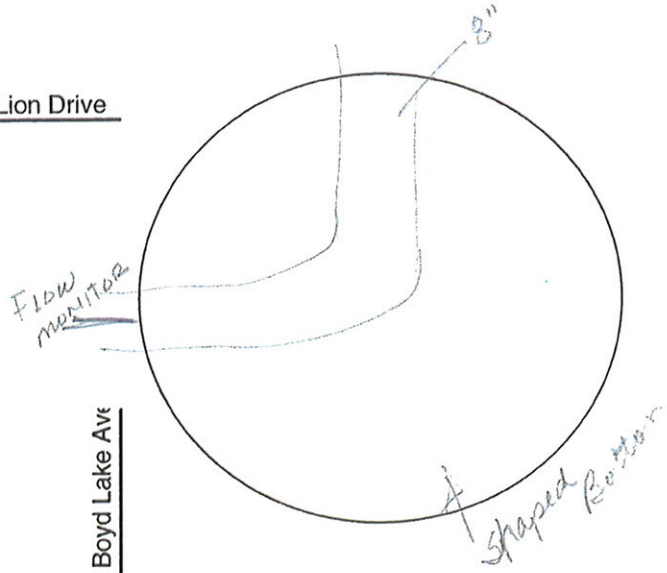
Sewer Manhole Field Data

MH ID: 6252 **Location:** U/S of Mountain View Lift Station

Material: Concrete Brick Liner/Insert PVC

Condition: Like New (Good) Moderate Poor Collapsed

Street: Mountain Lion Drive



Street: N. Boyd Lake Ave

N

Show:
Pipes
Flow Direction
Invert Benching

RIM Elev.:				
Heading:				
Drop:				
Diameter:				
Pipe Material:				
Flow IN / OUT				
Invert:				

Proj. No.:	32-1257.00	Remarks	MH in East Side Lift Station Basin	Prepared by	Date
Proj. Name:	**Loveland WW Model**			Checked by	Date
Title/Item:					Sheet of

AYRES ASSOCIATES

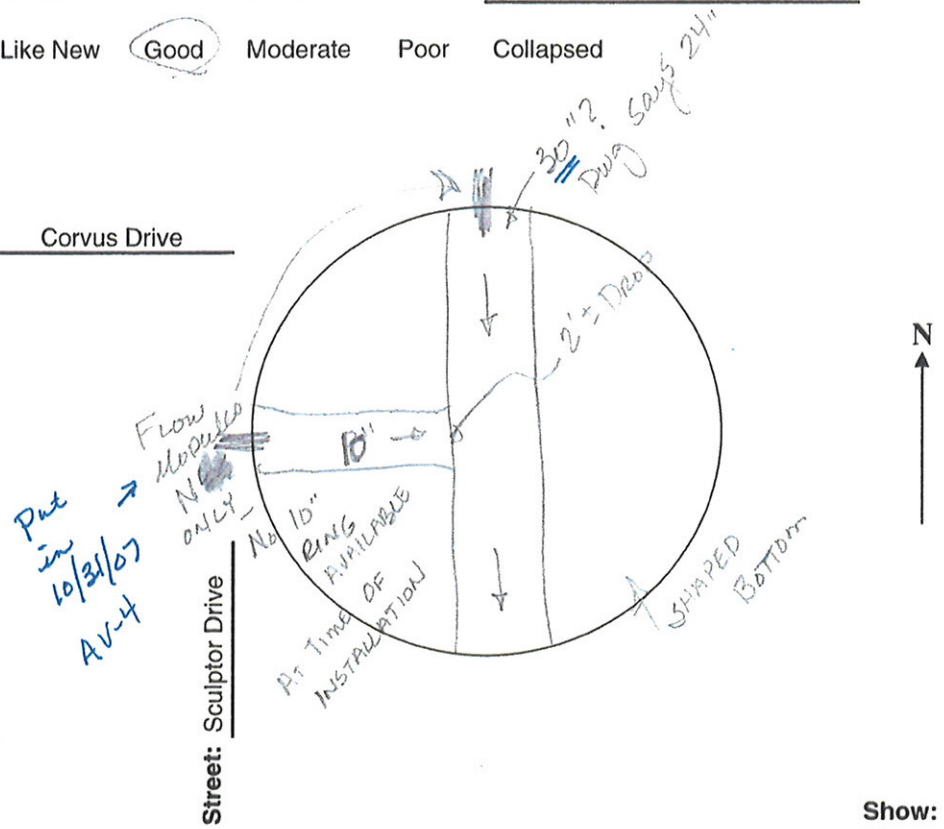
Sewer Manhole Field Data

MH ID: 7144 **Location:** SE corner of Corvus and Sculptor

Material: Concrete Brick Liner/Insert PVC

Condition: Like New (Good) Moderate Poor Collapsed

Street: Corvus Drive



Street: Sculptor Drive

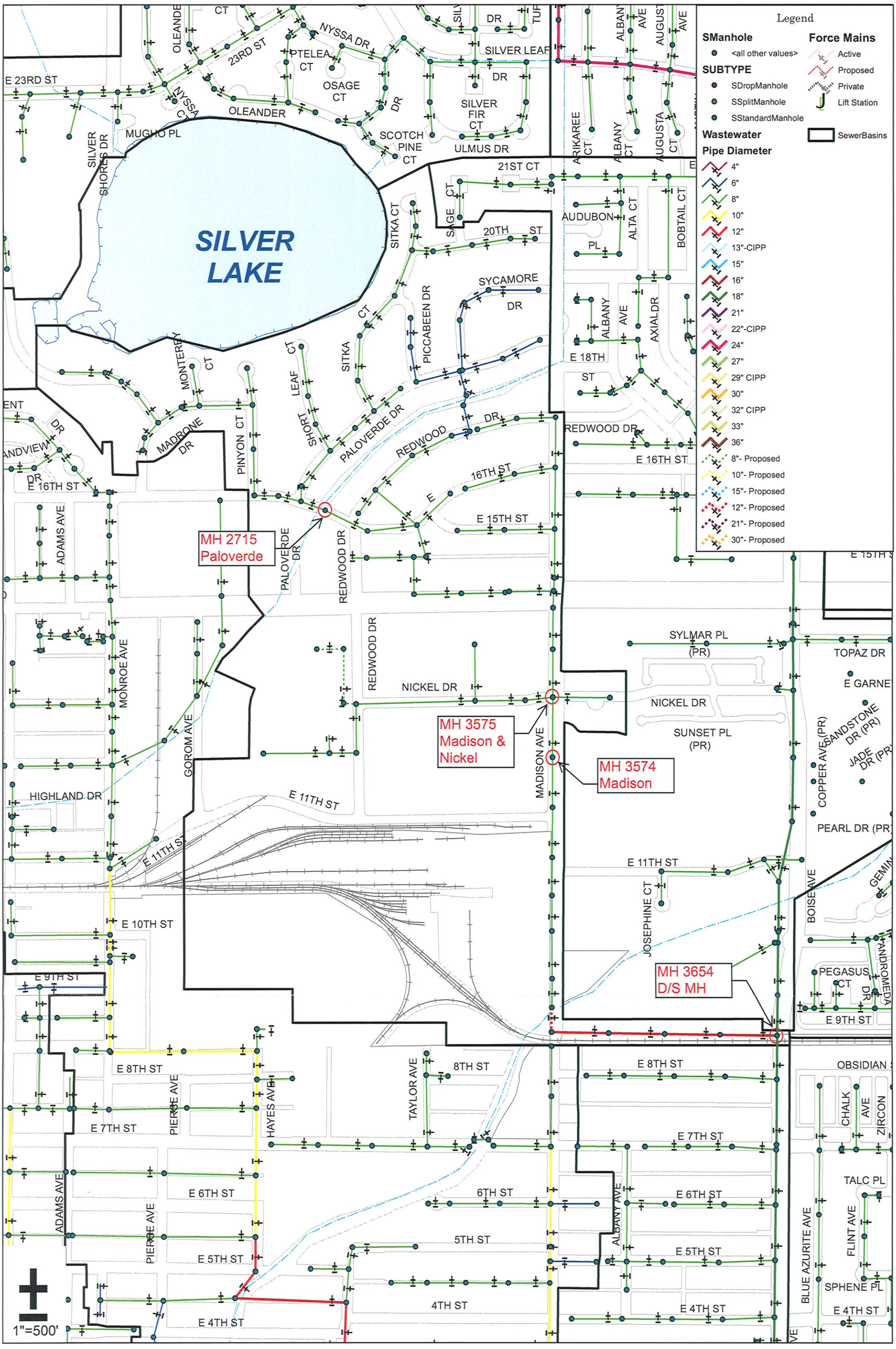
Show:
Pipes
Flow Direction
Invert Benching

RIM Elev.:				
Heading:				
Drop:				
Diameter:				
Pipe Material:				
Flow IN / OUT				
Invert:				

Proj. No.:	32-1257.00	Remarks	MH in East Side Lift Station Basin	Prepared by	Date
Proj. Name:	**Loveland WW Model**			Checked by	Date
Title/Item:					Sheet of

Madison Basin: Manhole Sketches

Madison Avenue Basin



AYRES ASSOCIATES

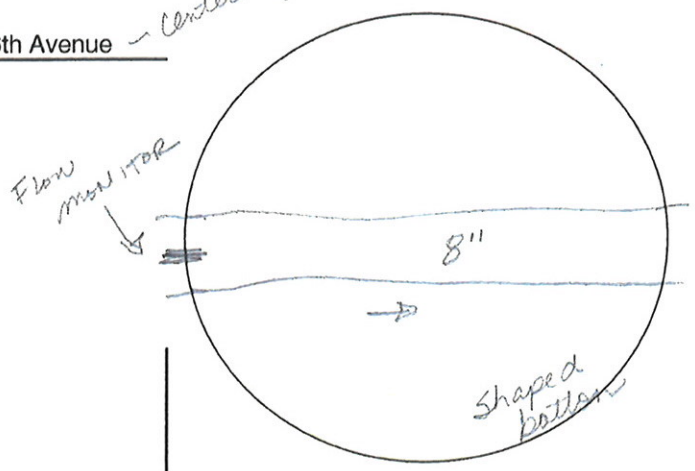
Sewer Manhole Field Data

MH ID: 2715 **Location:** 16th and Paloverde Dr. (East of ditch)

Material: Concrete Brick Liner/Insert _____

Condition: Like New Good (Moderate) Poor Collapsed

Street: 16th Avenue – center of road



Brick risers older MH
- Installed hook to put data box on

N

Show:
Pipes
Flow Direction
Invert Benching

RIM Elev.:				
Heading:				
Drop:				
Diameter:				
Pipe Material:				
Flow IN / OUT				
Invert:				

Proj. No.:	32-1257.00	Remarks	MH in Madison Ave. Basin	Prepared by	Date
Proj. Name:	**Loveland WW Model**			Checked by	Date
Title/Item:					Sheet of

AYRES ASSOCIATES

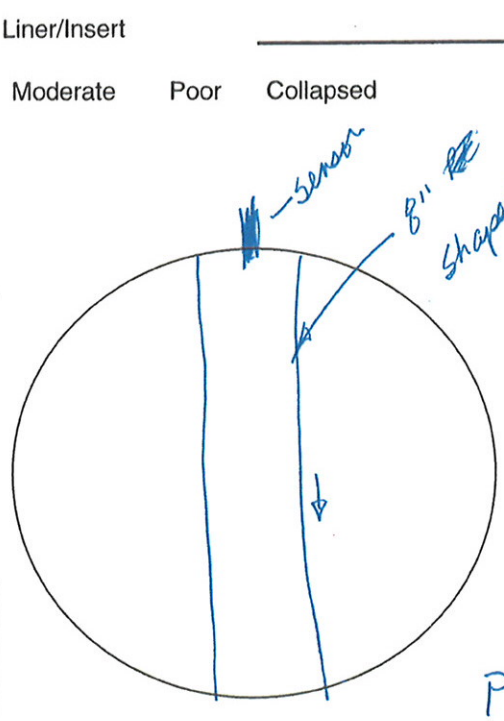
Sewer Manhole Field Data

MH ID: 3575 4 **Location:** ~~Nickel Drive~~ and Madison Avenue

Material: Concrete Brick Liner/Insert _____

Condition: Like New Good Moderate Poor Collapsed

Street: Nickel Drive



Street: Madison Ave.

put bolt in brick to hold unit (on e)

Show:
Pipes
Flow Direction
Invert Benching

RIM Elev.:				
Heading:				
Drop:				
Diameter:				
Pipe Material:				
Flow IN / OUT				
Invert:				

Proj. No.:	32-1257.00	Remarks	MH in Madison Ave. Basin	Prepared by	Date
Proj. Name:	**Loveland WW Model**			Checked by	Date
Title/Item:					Sheet of

AYRES ASSOCIATES

Sewer Manhole Field Data

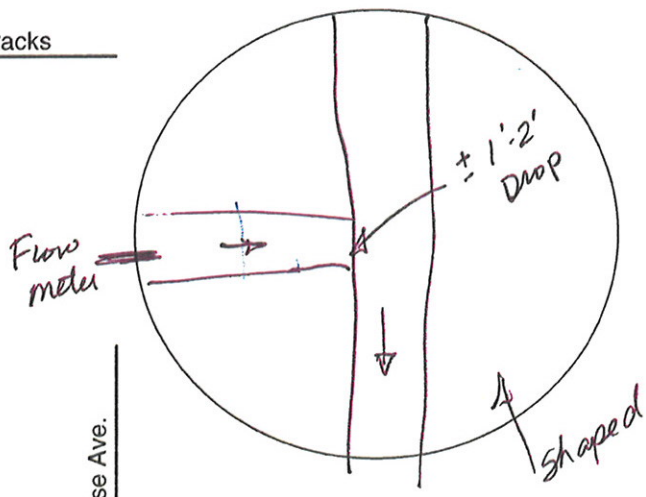
MH ID: 3654 **Location:** Boise and RR Tracks

Material: Concrete Brick Liner/Insert _____

Condition: Like New Good (Moderate) Poor Collapsed

Lots of corrosion around adjusting rings at top

Street: RR Tracks



Street: Boise Ave.

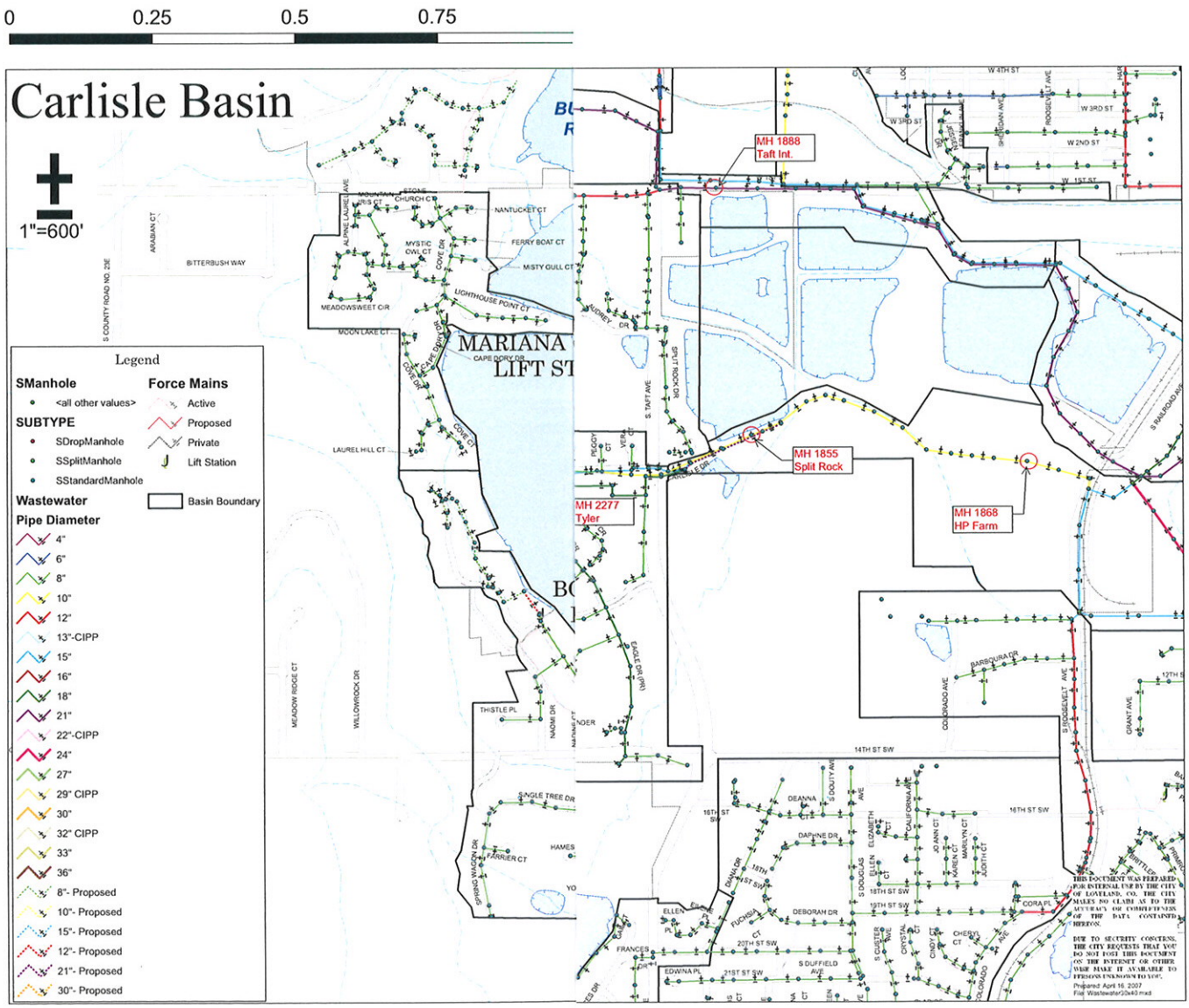
Bolt is mounted to hold box - corrosion on bolt

Show:
Pipes
Flow Direction
Invert Benching

RIM Elev.:				
Heading:				
Drop:				
Diameter:				
Pipe Material:				
Flow IN / OUT				
Invert:				

Proj. No.:	32-1257.00	Remarks	MH in Madison Ave. Basin	Prepared by	Date
Proj. Name:	**Loveland WW Model**			Checked by	Date
Title/Item:					Sheet of

Carlisle Basin: Manhole Sketches


0
0.25
0.5
0.75
Carlisle Basin
1"=600'
MH 1888
Taft Int.
MH 1855
Split Rock
MH 1868
HP Farm
MH 2277
Tyler
MARIANA
LIFT ST
Legend
SManhole
<all other values>
SUBTYPE
SDropManhole
SSplitManhole
SStandardManhole
Wastewater
Pipe Diameter
4"
6"
8"
10"
12"
13"-CIPP
15"
16"
18"
21"
22"-CIPP
24"
27"
29" CIPP
30"
32" CIPP
33"
36"
8"- Proposed
10"- Proposed
15"- Proposed
12"- Proposed
21"- Proposed
30"- Proposed
Force Mains
Active
Proposed
Private
Lift Station
Basin Boundary
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Prepared April 16, 2007
File: Wastewater30x40.mxd

AYRES ASSOCIATES

Sewer Manhole Field Data

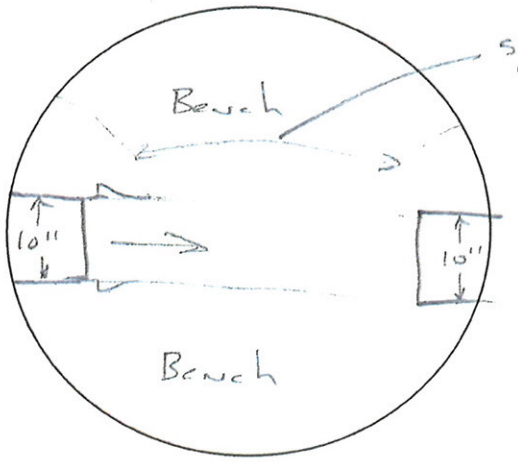
MH ID: [redacted] 1868 **Location:** East of Railroad Avenue / inside of locked gate

Material: (Concrete) Brick Liner/Insert _____

Condition: Like New Good (Moderate) Poor Collapsed

↳ ring + concrete @ top is degrading

Street: gravel road



signs of moisture in this area; possibly inflow

N

VCP

Street: Railroad Ave.

Show:
Pipes
Flow Direction
Invert Benching

RIM Elev.:				
Heading:				
Drop:				
Diameter:				
Pipe Material:				
Flow IN / OUT				
Invert:				

Proj. No.:	32-1257.00	Remarks	MH in the Carlisle Basin	Prepared by	Date
Proj. Name:	**Loveland WW Model**			Checked by	Date
Title/Item:					Sheet of

MH 1868

MH 1868

AYRES ASSOCIATES

Sewer Manhole Field Data

MH ID: 1855

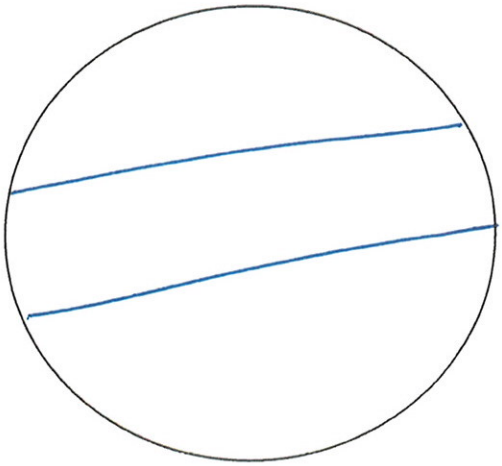
Material: Concrete Brick Liner / Insert _____

Condition: Collapsed Poor Moderate Good Like New

Corrosion: Ring / Cover Concrete Steps

N

Street: Mineral Lake



Street:

Show:
Pipes
Flow Direction
Invert Benching

RIM Elev.: _____

Heading:				
Drop:				
Diameter:				
Pipe Material:				
Flow IN / OUT				
Invert:				

Proj. No.:	Remarks	Prepared by	Date
Proj. Name:		Checked by	Date
Title/Item:			Sheet of

MH 1855

AYRES ASSOCIATES

Sewer Manhole Field Data

MH ID: 4008 Elbert Ave. South of Ditch

N

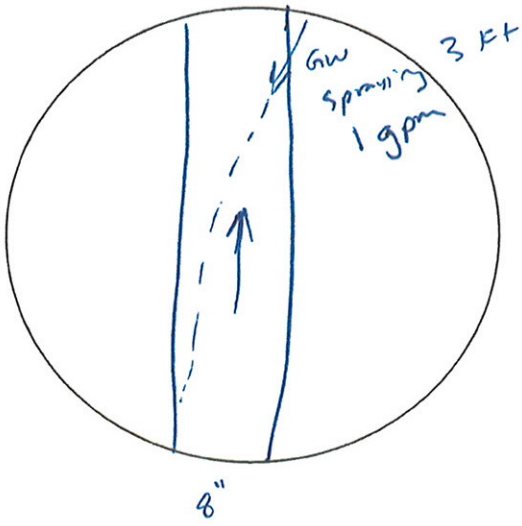
Material: (Concrete) Brick Liner / Insert _____

Condition: Collapsed Poor Moderate (Good) Like New

Corrosion: Ring / Cover: light Concrete: Staining Steps: Good

Moderate odor

Street: _____



Bench looks Slippery

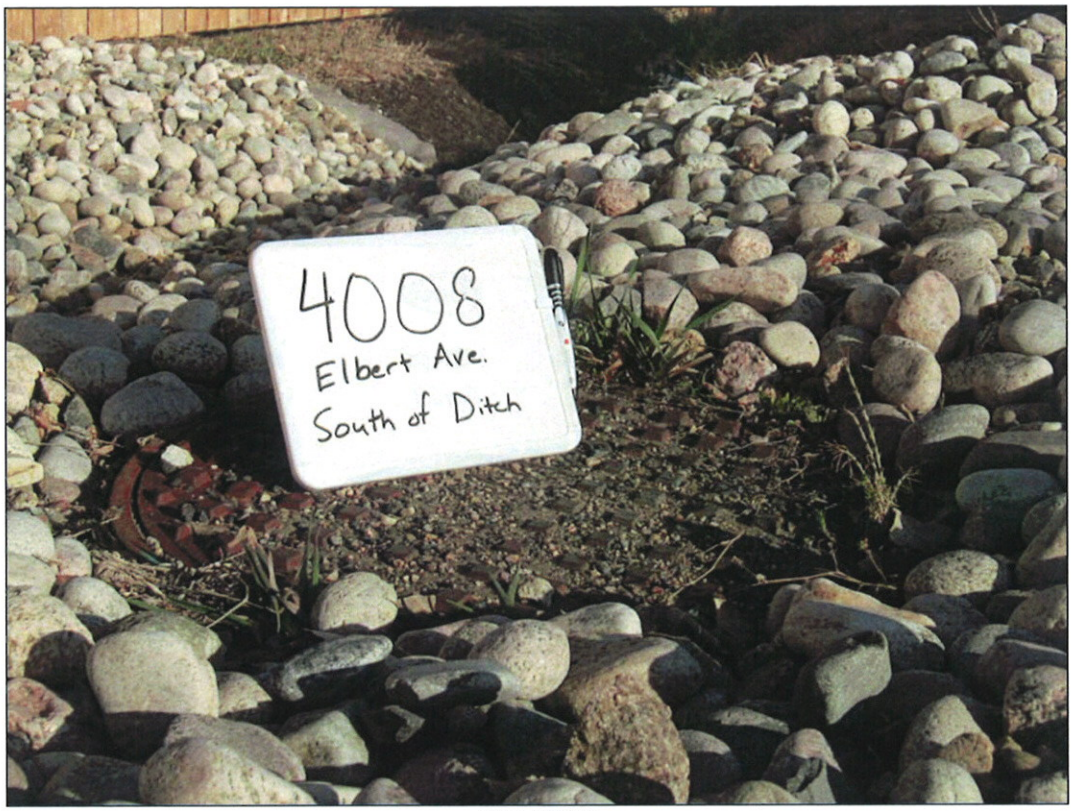
Street: Elbert

Show:
Pipes
Flow Direction
Invert Benching

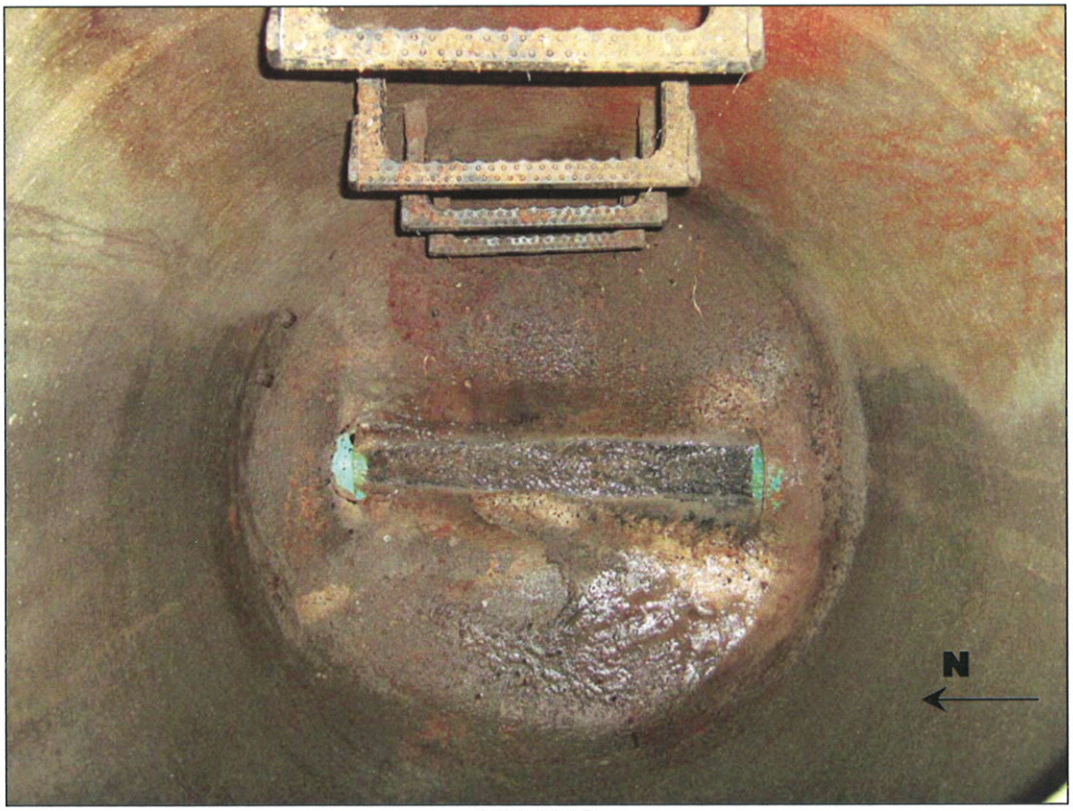
RIM Elev.: _____

Heading:				
Drop:				
Diameter:				
Pipe Material:				
Flow IN / OUT				
Invert:				

Proj. No.:	Remarks	Prepared by	Date
Proj. Name:		Checked by	Date
Title/Item:			Sheet of



MH 4008



MH 4008

AYRES ASSOCIATES

Sewer Manhole Field Data

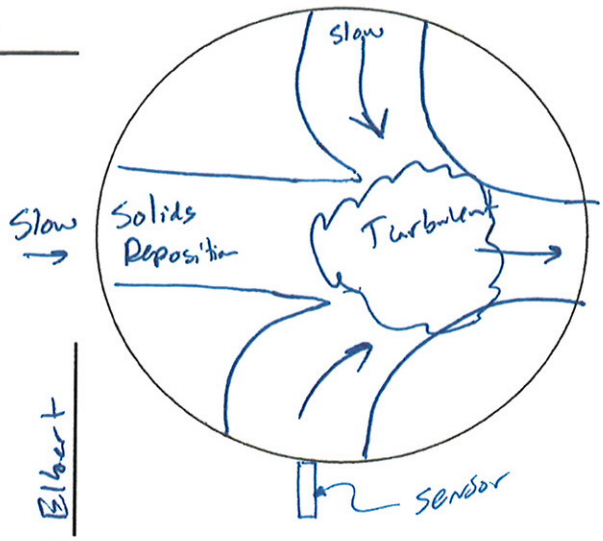
MH ID: 4007 Elbert Ave at SW 10th

Material: (Concrete) Brick Liner / Insert _____

Condition: Collapsed Poor (Moderate) Good Like New

Corrosion: Ring / Cover: Heavy Concrete Steps: fair

Street: SW 10th



Bench wet, some infiltration

Street: Elbert

N

Show:
Pipes
Flow Direction
Invert Benching

RIM Elev.:				
Heading:				
Drop:				
Diameter:				
Pipe Material:				
Flow IN / OUT				
Invert:				

Proj. No.:	Remarks	Prepared by	Date
Proj. Name:		Checked by	Date
Title/Item:			Sheet of

MH 4007

MH 4007

AYRES ASSOCIATES

Sewer Manhole Field Data

MH ID: 3930 Field / NCWCD Power Row South of Bordeaux

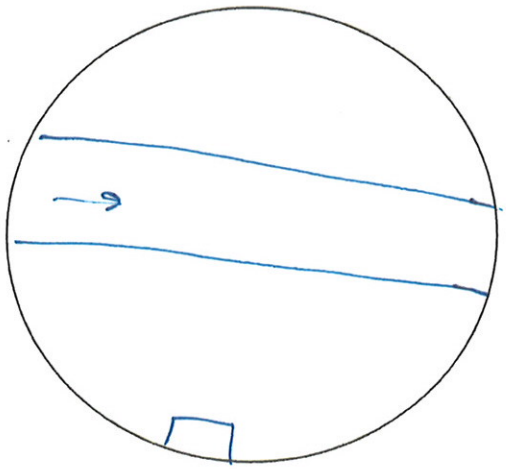
N

Material: Concrete Brick Liner / Insert _____

Condition: Collapsed Poor Moderate Good Like New

Corrosion: Ring / Cover: Moderate | Concrete: not bad | Steps: o/c - moderate

Street: Field Road



minor seepage between base + first riser

entire Cone section cracked at west step insert

Street:

Show:
Pipes
Flow Direction
Invert Benching

RIM Elev.:				
Heading:				
Drop:				
Diameter:				
Pipe Material:				
Flow IN / OUT				
Invert:				

Proj. No.:	Remarks	Prepared by	Date
Proj. Name:		Checked by	Date
Title/Item:			Sheet of

MH 3930

MH 3930

AYRES ASSOCIATES

Sewer Manhole Field Data

MH ID: 3971 Wilson North of Carlisle

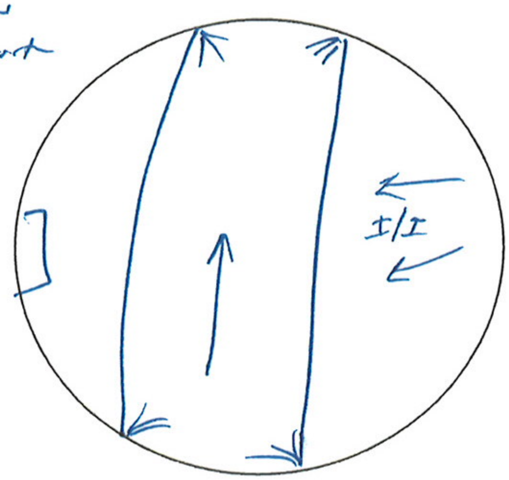
Material: (Concrete — circled) Brick Liner / Insert ____________

Condition: Collapsed Poor Moderate (Good — circled) Like New

Corrosion:
Ring / Cover: minor
Concrete: minor
Steps: good

N ↑

Street: 9th Place SW 50 Yards North



Infiltration at MH Joints

Street: Wilson

Drill in anchor

Show:
Pipes
Flow Direction
Invert Benching

RIM Elev.: ____________

Heading: ________ ________ ________ ________

Drop: ________ ________ ________ ________

Diameter: ________ ________ ________ ________

Pipe Material: ________ ________ ________ ________

Flow IN / OUT ________ ________ ________ ________

Invert: ________ ________ ________ ________

Proj. No.:	Remarks	Prepared by	Date
Proj. Name:		Checked by	Date
Title/Item:			Sheet of

MH 3971

MH 3971

AYRES ASSOCIATES

Sewer Manhole Field Data

MH ID: 3958

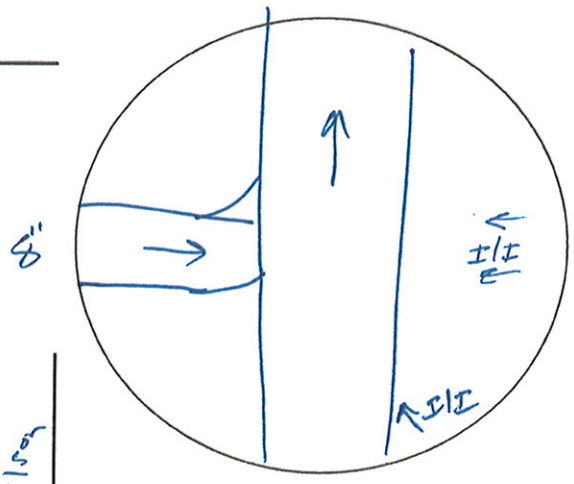
Material: Concrete Brick Liner / Insert _____

Condition: Collapsed Poor Moderate Good Like New

Corrosion: Ring / Cover Concrete Steps

minor good

Street: _____



I/I or bench but risers look dry

Drill in anchor

Visor

Street:

Monitor both 12" + 8" Here

N

Show:
Pipes
Flow Direction
Invert Benching

RIM Elev.: _____

Heading:				
Drop:				
Diameter:				
Pipe Material:				
Flow IN / OUT				
Invert:				

Proj. No.:	Remarks	Prepared by	Date
Proj. Name:		Checked by	Date
Title/Item:			Sheet of

MH 3958

MH 3958

AYRES ASSOCIATES

Sewer Manhole Field Data

MH ID: 2109 Carlisle – 8" VCP

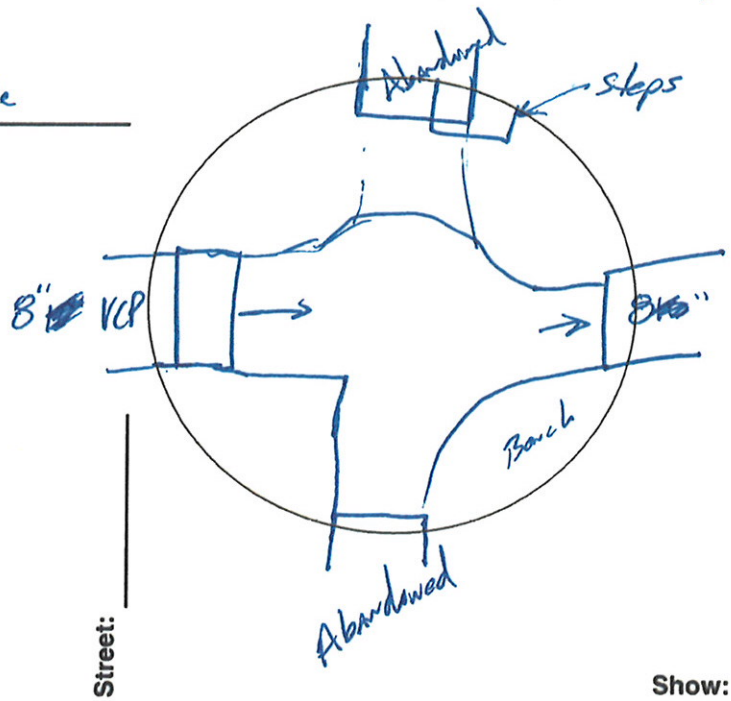
Material: (Concrete) Brick Liner / Insert _____

Condition: Collapsed Poor Moderate (Good) Like New

Corrosion: Ring / Cover Dirty Concrete Steps - some, but solid, small, wide spacing & not in line

Walt Clark Middle School

Street: Carlisle



Anchor to top step

Show:
Pipes
Flow Direction
Invert Benching

RIM Elev.:				
Heading:				
Drop:				
Diameter:				
Pipe Material:				
Flow IN / OUT				
Invert:				

Proj. No.:	Remarks	Prepared by	Date
Proj. Name:		Checked by	Date
Title/Item:			Sheet of

MH 2109

MH 2109

AYRES ASSOCIATES

Sewer Manhole Field Data

MH ID: 4866 Carlisle 15" PVC

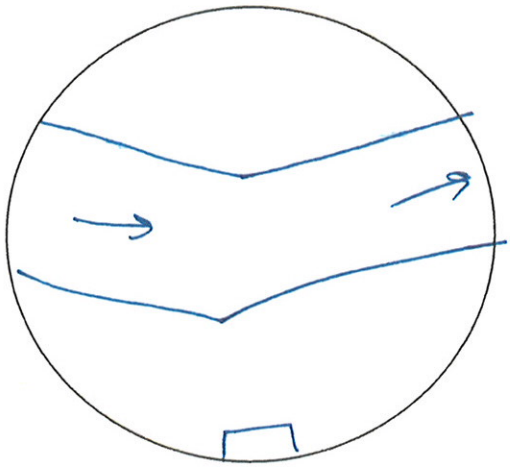
Material: (Concrete) Brick Liner / Insert _____

Condition: Collapsed Poor Moderate Good (Like New) → min leaks into MH @ top.

Corrosion: Ring / Cover none Concrete none Steps none - like new

Walt Clark

Street: Carlisle



No I/I

use steps for anchor

Street:

N

Show:
Pipes
Flow Direction
Invert Benching

RIM Elev.: _____

Heading:				
Drop:				
Diameter:				
Pipe Material:				
Flow IN / OUT				
Invert:				

Proj. No.:	Remarks	Prepared by	Date
Proj. Name:		Checked by	Date
Title/Item:			Sheet of

MH 4866

MH 4866

AYRES ASSOCIATES

Sewer Manhole Field Data

MH ID: 2272 End of 8" VCP line

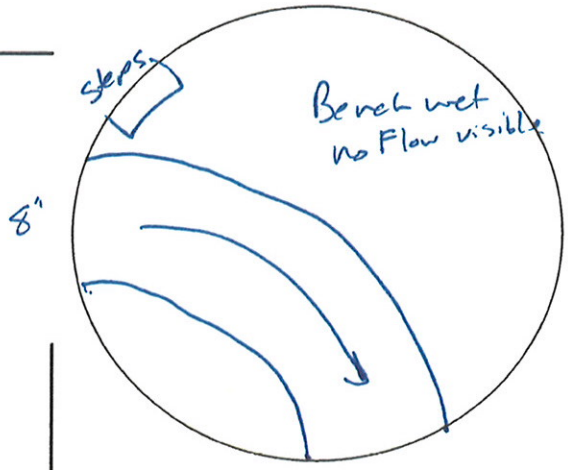
N

Material: (Concrete) Brick Liner / Insert _____

Condition: Collapsed Poor (Moderate) old Good Like New

Corrosion: Ring / Cover (Heavy) moderate Concrete minor Steps moderate

Street: Carlisle



Steps ok to anchor to

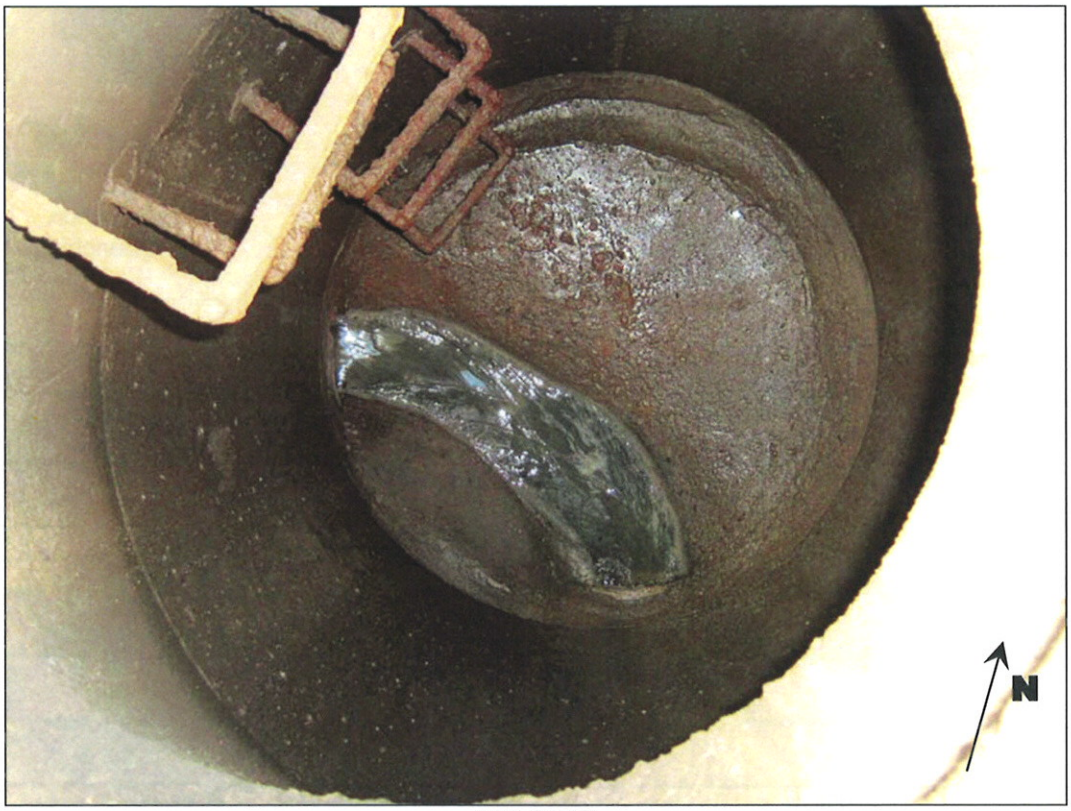
Street:

Show:
Pipes
Flow Direction
Invert Benching

RIM Elev.:				
Heading:				
Drop:				
Diameter:				
Pipe Material:				
Flow IN / OUT				
Invert:				

Proj. No.:	Remarks	Prepared by	Date
Proj. Name:		Checked by	Date
Title/Item:			Sheet of

MH 2272



MH 2272

AYRES ASSOCIATES

Sewer Manhole Field Data

MH ID: 2271 15" PVC in Carlisle

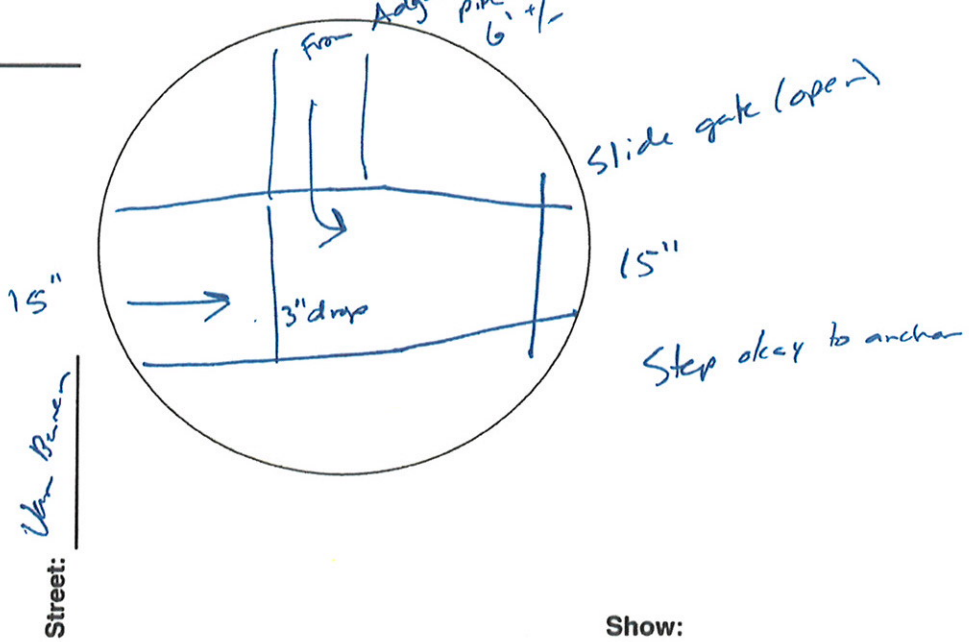
Material: (Concrete) Brick Liner / Insert _____

Condition: Collapsed Poor Moderate (Good) Like New

Corrosion: Ring / Cover: moderate; Concrete: moderate; Steps: none (plastic coated)

N

Street: Carlisle



Show:
Pipes
Flow Direction
Invert Benching

RIM Elev.: _____

Heading:				
Drop:				
Diameter:				
Pipe Material:				
Flow IN / OUT				
Invert:				

Proj. No.:	Remarks	Prepared by	Date
Proj. Name:		Checked by	Date
Title/Item:			Sheet of

MH 2271

MH 2271

AYRES ASSOCIATES

Sewer Manhole Field Data

MH ID: ~~22272277~~ 2277

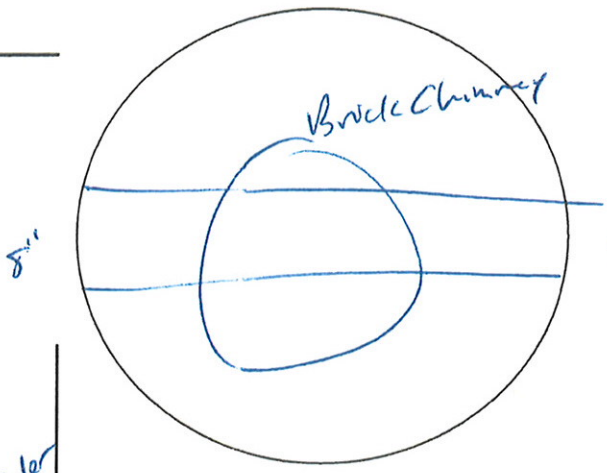
Material: Concrete (Brick) Chimney – tall Liner / Insert

Condition: Collapsed (Poor) old Moderate Good Like New

Corrosion: Ring / Cover Concrete Steps

N

Street: Carlisle

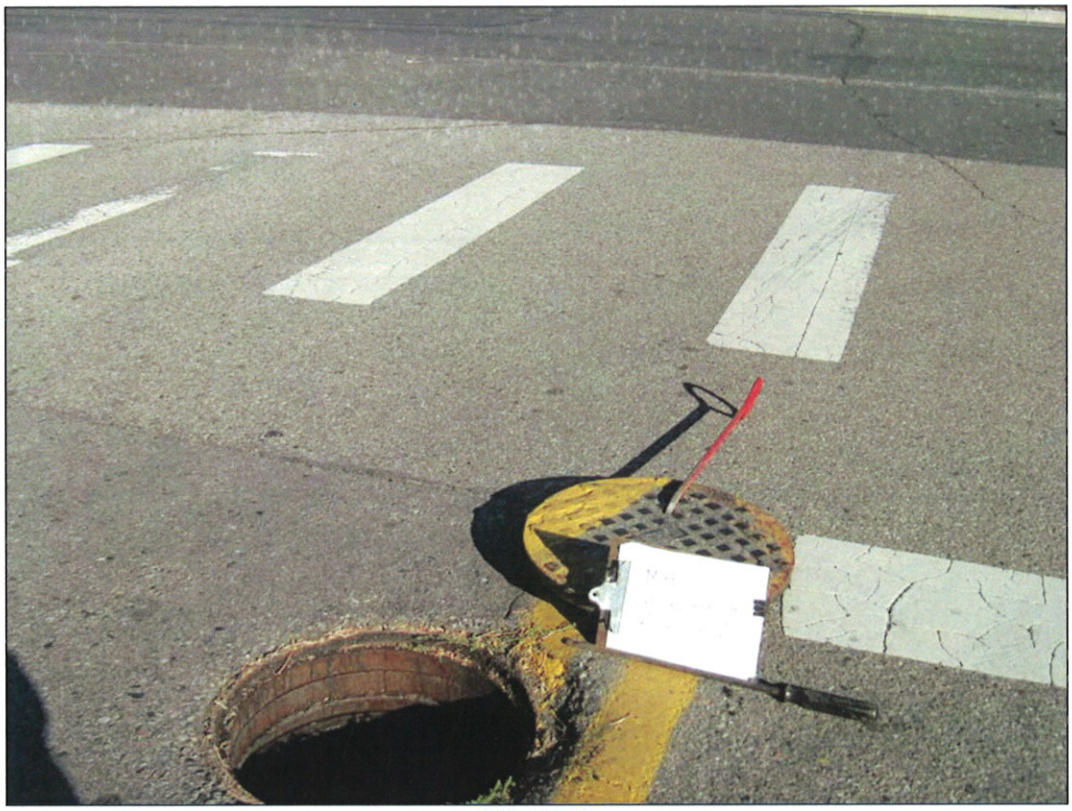


Anchor to Step

Show:
Pipes
Flow Direction
Invert Benching

RIM Elev.:				
Heading:				
Drop:				
Diameter:				
Pipe Material:				
Flow IN / OUT				
Invert:				

Proj. No.:	Remarks	Prepared by	Date
Proj. Name:		Checked by	Date
Title/Item:			Sheet of



MH 2277

MH 2277

AYRES ASSOCIATES

Sewer Manhole Field Data

MH ID: 2261 Glenda + 3rd st SW

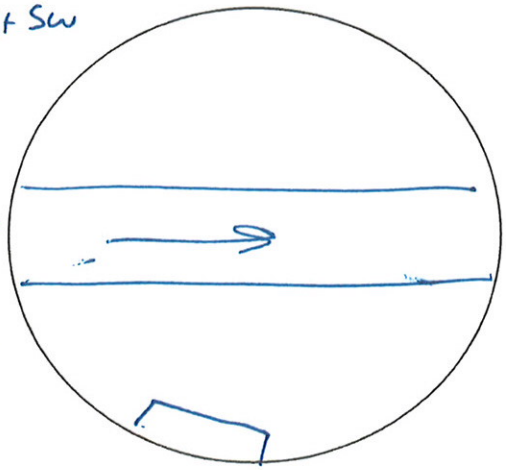
N

Material: (Concrete) Brick Liner / Insert _____

Condition: Collapsed Poor Moderate (Good) Like New

Corrosion: Ring / Cover Concrete Steps none noted

Street: ~~Glenda~~ 3rd st SW



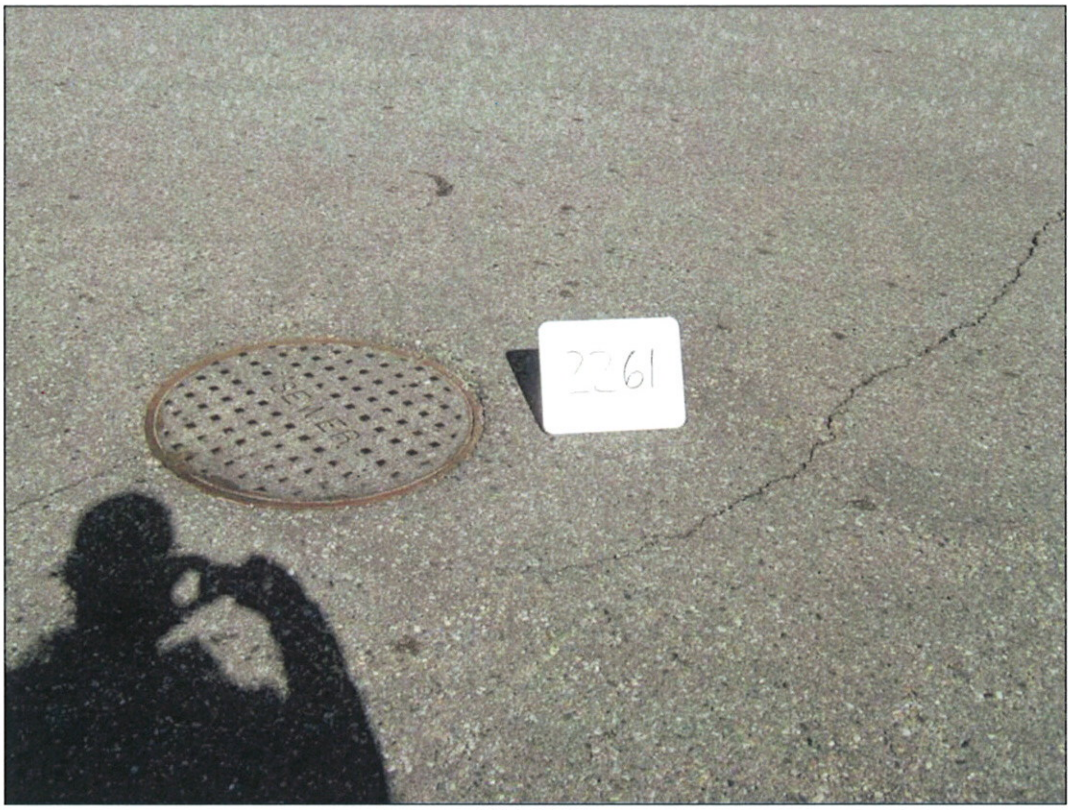
no I/E

Step okay to anchor but a little low anchor to grade ring

Show:
Pipes
Flow Direction
Invert Benching

RIM Elev.:				
Heading:				
Drop:				
Diameter:				
Pipe Material:				
Flow IN / OUT				
Invert:				

Proj. No.:	Remarks	Prepared by	Date
Proj. Name:		Checked by	Date
Title/Item:			Sheet of



MH 2261

MH 2261

AYRES ASSOCIATES

Sewer Manhole Field Data

MH ID: 1088

Material: (Concrete) Brick Liner / Insert _____

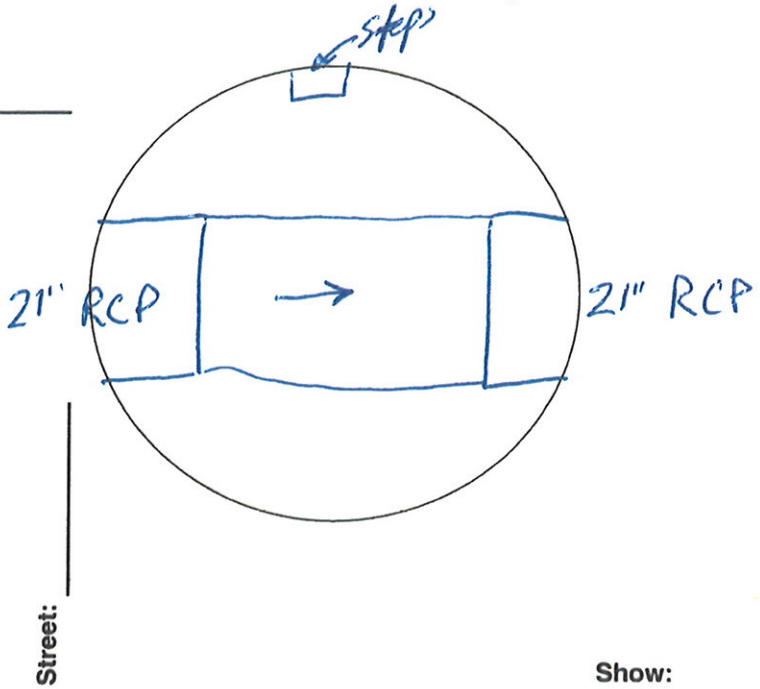
Condition: Collapsed Poor (Moderate) Good Like New

Corrosion: Ring / Cover Concrete Steps very little

N

Joints look rough

Street: 1st



Show:
Pipes
Flow Direction
Invert Benching

RIM Elev.:				
Heading:				
Drop:				
Diameter:				
Pipe Material:				
Flow IN / OUT				
Invert:				

Proj. No.:	Remarks	Prepared by	Date
Proj. Name:		Checked by	Date
Title/Item:			Sheet of

AYRES ASSOCIATES

Sewer Manhole Field Data

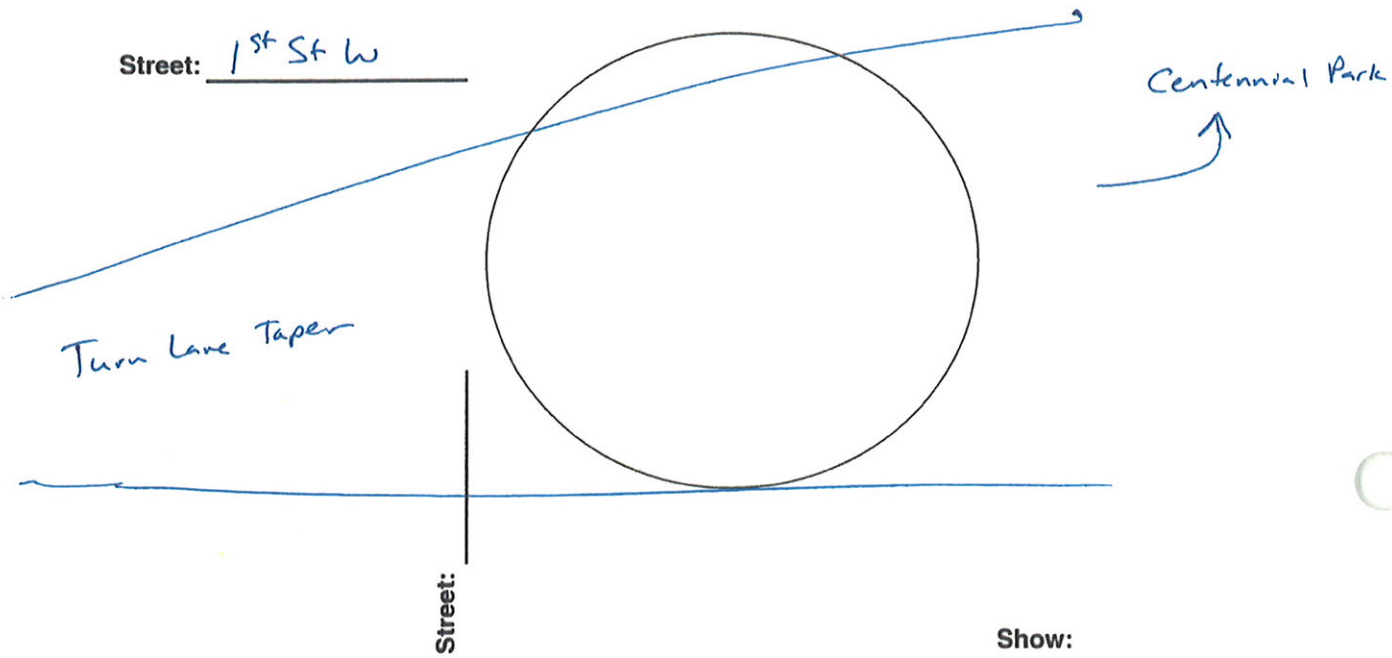
MH ID: 1888

Material: Concrete Brick Liner / Insert _____

Condition: Collapsed Poor Moderate Good Like New

Corrosion: Ring / Cover Concrete Steps

N



Show:
Pipes
Flow Direction
Invert Benching

RIM Elev.:				
Heading:				
Drop:				
Diameter:				
Pipe Material:				
Flow IN / OUT				
Invert:				

Proj. No.:	Remarks	Prepared by	Date
Proj. Name:		Checked by	Date
Title/Item:			Sheet of

MH 1888

MH 1888

AYRES ASSOCIATES

Sewer Manhole Field Data

MH ID: 4006 Elbert Ave. North of Ditch FM Discharge

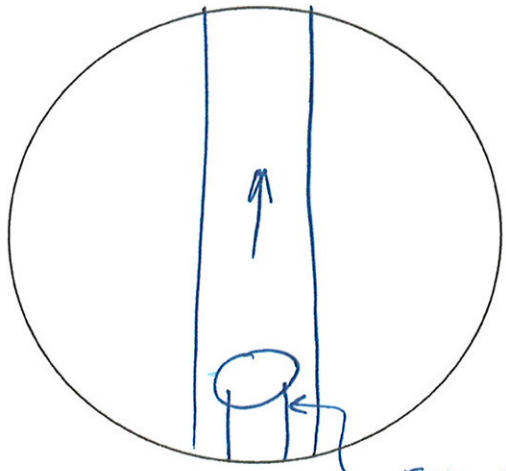
Material: (Concrete) Brick Liner / Insert _____

Condition: Collapsed (Poor) Moderate Good Like New

Corrosion: Ring / Cover Heavy Concrete Extreme Steps Medium

N

Street: _____



Fast Flow

Good bench to stand on

Show:
Pipes
Flow Direction
Invert Benching

RIM Elev.:				
Heading:				
Drop:				
Diameter:				
Pipe Material:				
Flow IN / OUT				
Invert:				

Proj. No.:	Remarks	Prepared by	Date
Proj. Name:		Checked by	Date
Title/Item:			Sheet of

MH 4006

MH 4006

AYRES ASSOCIATES

Sewer Manhole Field Data

MH ID: 4861

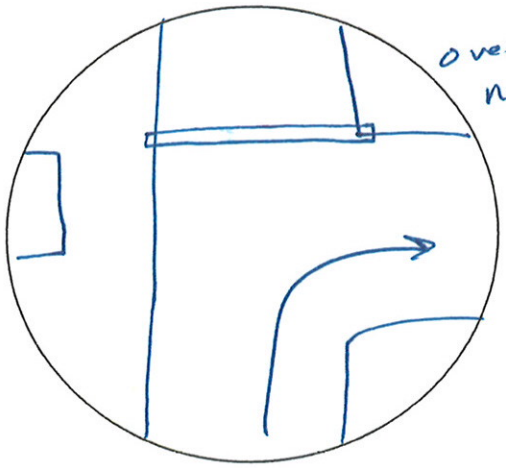
Material: (Concrete) Brick Liner / Insert _____

Condition: Collapsed Poor Moderate (Good) Like New

Corrosion: Ring / Cover minor Concrete Steps new

N ↑

Street: _____



overflow weir
no flow to north

MH does not appear to have any I/I

3/21/08 Debris in MH
Bolt in anchor
lots of grade ring

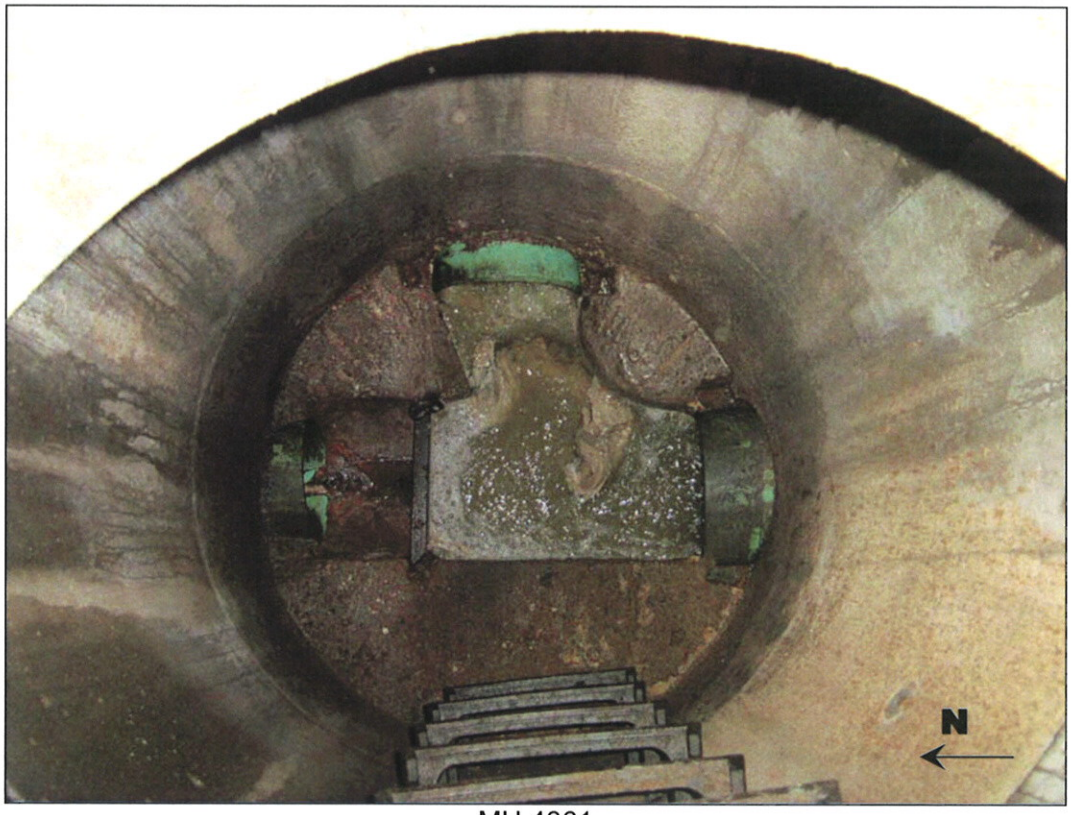
Street: _____

Show:
Pipes
Flow Direction
Invert Benching

RIM Elev.:				
Heading:				
Drop:				
Diameter:				
Pipe Material:				
Flow IN / OUT				
Invert:				

Proj. No.:	Remarks	Prepared by	Date
Proj. Name:		Checked by	Date
Title/Item:			Sheet of

MH 4861



MH 4861

AYRES ASSOCIATES

Sewer Manhole Field Data

MH ID: 1867 1868

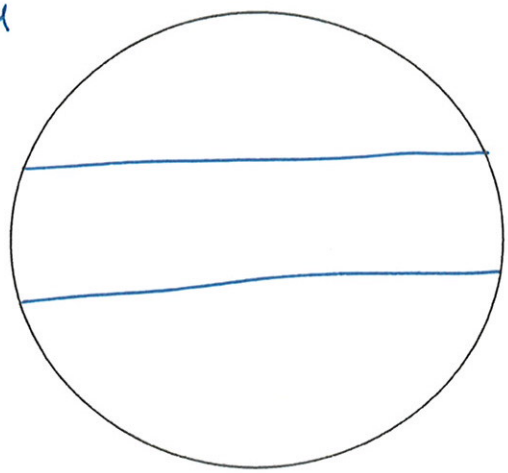
N

Material: Concrete Brick Liner / Insert _____

Condition: Collapsed Poor Moderate Good Like New

Corrosion: Ring / Cover Concrete Steps

Street: HP Farm Road



Street:

Show:
Pipes
Flow Direction
Invert Benching

RIM Elev.:				
Heading:				
Drop:				
Diameter:				
Pipe Material:				
Flow IN / OUT				
Invert:				

Proj. No.:	Remarks	Prepared by	Date
Proj. Name:		Checked by	Date
Title/Item:			Sheet of

MH 1868

MH 1868

AYRES ASSOCIATES

Sewer Manhole Field Data

MH ID: 4816 Cul de Sact at End of 3rd St SW

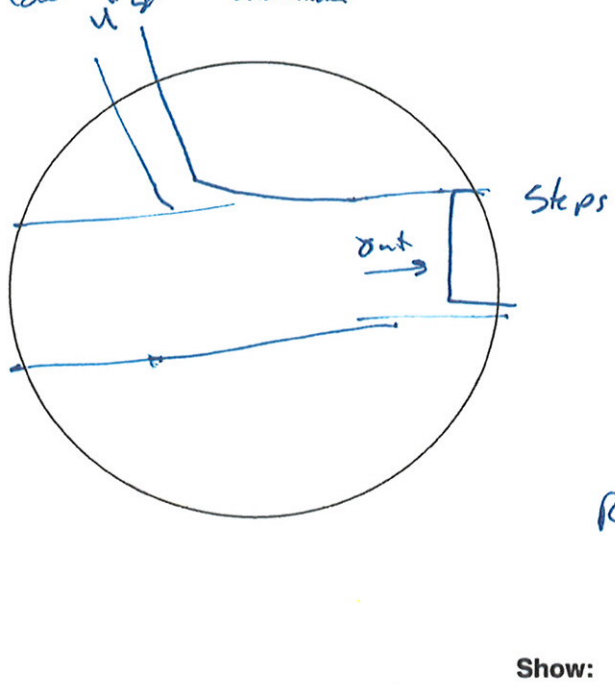
N

Material: (Concrete) Brick Liner / Insert _____

Condition: Collapsed Poor Moderate (Good) Like New

Corrosion: Ring / Cover low Concrete low Steps aluminum Minimal

Street: 3rd St SW



Street:

appear to be drain holes in side of MH but not draining water

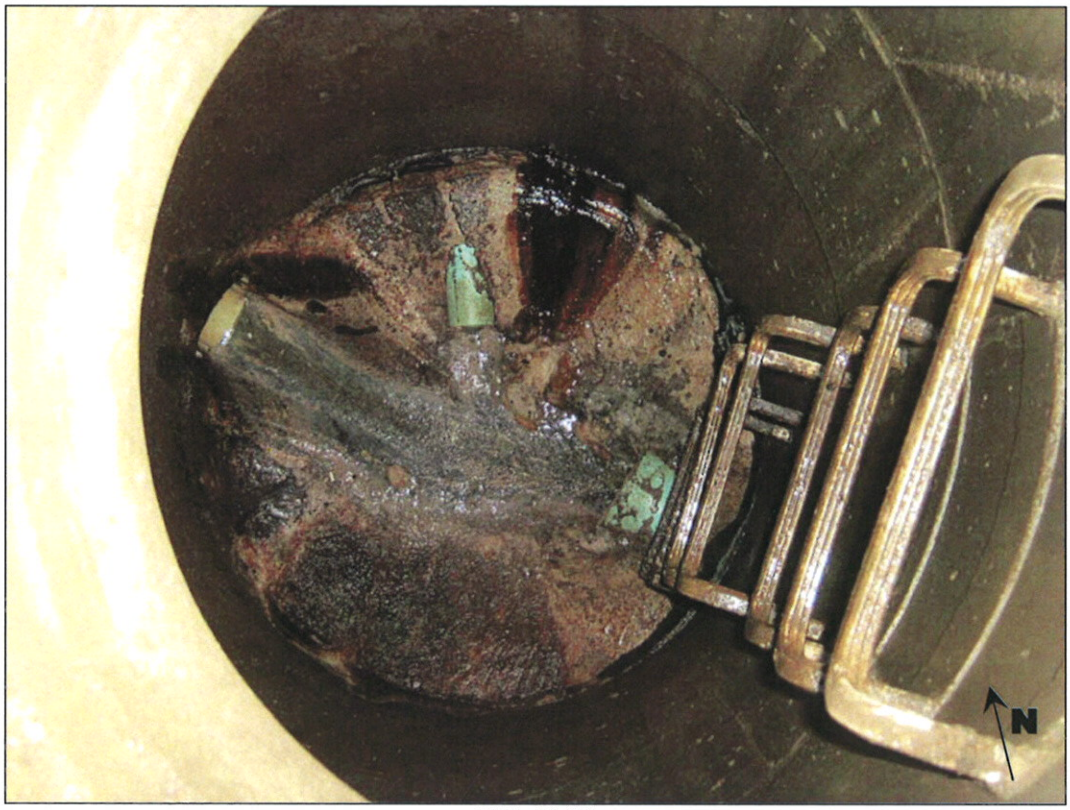
Rough invert

Show:
Pipes
Flow Direction
Invert Benching

RIM Elev.:				
Heading:				
Drop:				
Diameter:				
Pipe Material:				
Flow IN / OUT				
Invert:				

Proj. No.:	Remarks	Prepared by	Date
Proj. Name:		Checked by	Date
Title/Item:			Sheet of

MH 4816



MH 4816

Monitoring Logs

Loveland Wastewater Modeling
Ayres Project #: 32-1257.00

The following are **key dates** during the flow monitoring process:

Oct. 02, 2007 Initial day of monitor installations. We installed:
-MH 4587 (Carino's)
-MH 4597 (Loveland RV)
-MH 6252 (Mountian Lion & Boyd Lake)
-MH 2715 (Paloverde & ditch)
-MH 3654 (Boise Ave. & RR tracks)
-RG SHLS
-RG MVLS

Oct. 03, 2007 Second day of monitor installations. We installed:
-MH 1854 (U/S 10" Carlisle)
-MH 1868 (D/S 10" Carlisle)
-MH 3575 (Maddison & Nickel)
-MH 8074 (crossing @ I-25)
-MH 6768 (Hahn's Peak W. of Rocky Mountain Ave.)
-MH 6795 (Piney River W. of McWhinney)
-MH 6786 (Piney River & McWhinney)
-RG I-25
-RG SvcCtr

Oct. 03 2007 Rockies vs Phillies (4-2) 1:30-4:30pm

Oct. 04, 2007 @ 12:00 is the "beginning" point for all the data downloads

Oct. 04 2007 Rockies vs Phillies (10-5) 1:30-5:00pm
Oct. 06 2007 Rockies vs Phillies (2-1) 7:30-10:30pm
Oct. 07 2007 Broncos vs Chargers (3-43) 2:00-6:00pm

Oct. 11 2007 Rockies vs Diamondback NLCS (5-1) 6:30-9:30pm

Oct. 12, 2007 Installed last two sites and downloaded all data except at Madison & Nickel
-MH 8063 (Rocky Mtn. Ave. & Equalizer Ditch)
-MH 7144 (SE corner of Corvous & Sculptor)
Oct. 12 2007 Rockies vs Diamondback NLCS (3-2) 8:00pm-12:30am

Oct. 13, 2007 Intense thunderstorm hits Ft. Collins and presumably Loveland around 2:00 pm then eventually slows to a steady drizzle for the remainder of the day

Oct. 14, 2007 Drizzle continues all day long
Oct. 14 2007 Broncos have a bye week
Oct. 14 2007 Rockies vs Diamondback NLCS (4-1) 6:30-9:30pm

Oct. 15, 2007 Clear day with no rain
Oct. 15 2007 Rockies vs Diamondback NLCS (6-4) 8:30-11:30pm
Oct. 21, 2007 Rain and snow flurries throughout this day. Possibly a constant drizzle in Loveland.

Oct. 21 2007 Broncos vs. Steelers (0-0) 6:15-9:15pm (31-28)

Oct. 23, 2007 Downloaded SvcCntr and I-25 Rain Gauges
Performed diagnostics on the UltraSonic unit at I-25. It appears the US is sucking voltage down too low with in a couple of days and then the unit doesn't work. We replaced the batteries and will check them again next week. The batteries we put into the unit are not as good as the Energizer "529" that we had been using.

Oct. 24 2007 Rockies at RedSocks WorldSeries (1-13) 6:30-10:00pm
Oct. 25 2007 Rockies at RedSocks WorldSeries (1-2) 6:30-10:00pm
Oct. 27 2007 Rockies vs RedSocks WorldSeries (5-10) 6:30-11:00pm
Oct. 28 2007 Rockies vs RedSocks WorldSeries (3-4) 6:30-10:05pm
Oct. 29 2007 Broncos vs. Packers MNF(0-0) 6:30-9:30pm

Oct. 31, 2007 Downloaded all gauges and relocated Madison&Nickel and US Carlisle

Nov. 04 2007 Broncos at Lions (0-0) 11:00-2:15pm
Nov. 11 2007 Broncos at Chiefs (0-0) 11:00-2:15pm
Nov. 19 2007 Broncos vs. Titans MNF(0-0) 6:30-9:30pm
Nov. 23, 2007 Big shopping day after Thanksgiving (watch MH#8074)
Nov. 25 2007 Broncos at Bears (0-0) 11:00-2:15pm
Dec. 02 2007 Broncos at Raiders (0-0) 2:00-5:15pm
Dec. 09 2007 Broncos vs. Chiefs (0-0) 2:00-5:15pm
Dec. 13 2007 Broncos at Texans (0-0) 6:15-9:15pm
Dec. 24 2007 Broncos at Chargers (0-0) 6:00-9:00pm
Dec. 30 2007 Broncos vs. Vikings (0-0) 2:00-5:15pm

Jan. 3, 2008 Downloaded gauges at MHs 8074, 4587, 4597, 7144, 3654, 3574, & 2715.
We picked up the RG near MH 8074 too.

Jan. 10, 2008 Removed all flow monitors. Cables corroded – one data collector floated downstream to ESLS wetwell.

City of Loveland
Carlisle Basin Flow Monitor Log

3/26/08 Chris and Steve spent about three hours getting equipment ready – installing batteries, greasing o-rings and replacing desiccant, and getting the right size rings put on sensors.

3/27/08 A cold, wet and snowy day in SW Loveland. All but one of the flow monitor locations were installed with help from the Loveland crew. Randy, Dave and Nick helped us out with confined space entry. All of the pipes were smaller in diameter – only one scissor ring installation (Taft and First). The work went pretty fast, even considering the configuration time. Chris and Steve started with the crew early, and Sam came down at the third stop. Lunch with the crew at Doc's, then finished up at about 3:00. Infiltration observed in several manholes – even without ditches running. Ayres guys went back to the City shop to prep the last flow monitor and double check some configuration issues. One flow monitor did not have a working LED light, but otherwise was fine. Follow-up conversation with Dale Tramp at ISCO recommended sending the unit in for evaluation before end of warranty period. Chris to check on warranty period and follow up on the equipment.

4/8/08 Chris and Sam visited the flow monitor locations and downloaded the data. Level data was consistently good. Velocity data was consistently poor – occasional time intervals of data that looked reasonable, but significant periods of negative velocities – down to -4 ft/s. We saw this at several manholes. Survey data will allow us to create the flow rate using only the depth of flow, and we can use the intermittent good portions of velocity data to calculate manning's n. Before we schedule survey, though, we will review the available record drawing data to see how much additional survey data will be needed in that basin and obtain both at the same time. Flows are typically low in this basin – minimum flows down to 5 gpm. Ditches are still dry, and the Loveland schools were on Spring Break. Catching all the monitors except two was slightly less than a half days work – Carlisle basin is easy to get around, low traffic volumes and easy manhole access.

4/9/08 Chris and Sam met the crew at 12:30pm to download the location at First and Taft – traffic control required, and to install the last remaining monitor at Carlisle and Split Rock. Spent two hours with the crew, provided training to Nick on how the Flowlink Software works and how to download and configure the flow monitors. Johnny and Tom, Dave and Nick came out with us. All the monitors are now in place. Snow storm predicted for tonight, ditches not running yet and the Big Thompson not starting to show runoff. Rain started about 4:00pm.

4/20/08 Irrigation Ditches observed to be running in central and north areas of Loveland, specifically the ditch at 57th & 287.

4/23/08 Lake Ditch by Valley view, south of Loveland along 287 still dry.

5/15/08 Steve Z. and Sam L. downloaded data from all the flow monitors and rain gauges. The ditch crossing Elbert was running, Marianna Ditch crossing Wilson was wet but not running, the ditch near the 3rd and Glenda site was still dry.

5/26/08 This Memorial Day weekend was a wet. Monday was the wettest by far. Rain gauges should verify this and flow monitors might detect increased inflow due. CoCoRahs showed 0.7" of rain +/-.

5/30/08 Chris, Sam and Steve in the field for flow monitor maintenance at 5 key locations: MH 4008 – Elbert at the Ditch, MH 4007 – Elbert at 10th St. SW, MH 4866 – 15" in Carlisle at Walt Clark MS, MH 2272 – 15" in Carlisle at Van Buren and MH 1888 – at 1st and Taft. Elbert & 10th Street was in backwards, Elbert & the ditch was …., 1st and Taft was due to sediment, and the scissor jack got damaged by the camera and was replaced. Carlisle by Walt Clark Middle School 15" pipe – sensor was not producing consistent results, so the Ayres A/V Sensor 71.17 was installed for the remainder of the monitoring cycle. The City's 2150 unit was continued in that location, and recalibrated using the test tube apparatus.

We also visited the flow monitor at Split Rock Drive and inspected the site and data. No problems were observed following an accidental drop of the data collector at the last site visit. No corrosion observed. Flow depths appear to drop to zero at 4:30am – we discussed visiting the site at that time of day to verify the data as it seems unusual, given the extent of groundwater and old pipe systems upstream.

6/19/08 Katie and Sam downloaded data from all rain gauges and sewer monitors. All the sites that were fixed a month ago were providing good data.

7/2/08 Katie and I (Sam) along with a Loveland crew downloaded all the data and removed all the equipment from the basin.