Miller Environmental Corporation
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Committed to Leadership in Our Industry

April 20, 2015

Manitoba Conservation and Water Stewardship
Environmental Approvals
2nd Floor, 123 Main St.
Winnipeg, MB R3C 1A5

Attn: Tracey Braun, M. Sc. – Director Environmental Approvals Branch

Dear Ms. Braun:

RE: Repository Cell, Evaporator and New Building – Dangerous Goods Handling & Transportation Act Licence No. 58 HW S2 RRR

Please accept this as Miller Environmental Corporation's (Miller) response to Manitoba Conservation and Water Stewardship (Conservation) repository cell comments along with Miller's proposal for implementation of a thermal evaporator and construction of a new processing building. After meeting with Raj Rathanamo (Raj) and Bruce Webb of Conservation on March 19, 2015, Miller received direction to combine the repository cell, evaporator and new building submissions in the same proposal so that all could be managed within the same licence amendment process. Below are the details for each project.

Repository Cell

On February 2, 2015, Miller submitted a response to Conservation's Environmental Approval's Branch (EAB) document titled "Miller Repository Proposal Observations" (sent September 29, 2014 by Raj). Below are the responses to the EAB's questions and comments sent by Raj on March 12, 2015 generated from the February 2nd submission. All EAB observations are in bold.

Observation #2 includes a discussion on Miller's intent to use treated Leachate as wind dispersal control and observation #7 discusses Miller's plan to manage the precipitation (that enters the cell) through the leachate collection system.
EAB's position is that EAB would consider approval of treated leachate for dust control depending on the type and degree of treatment, the use of untreated leachate would not be considered. As such, please provide additional information pertaining to the proposed leachate management system, incorporating the following:

(a) estimated leachate flow rate during the operational life and after closure of the cell with final capping installed - under normal precipitation conditions.

During the operation of the cell, leachate flow rates will be dependent on precipitation events. Historical Environment Canada precipitation data from 1981-2010 is provided in Appendix A. Average annual precipitation during this time period was 576.5 mm which would be our estimated leachate flow rate during the operational life of one third of the total cell floor area. As mentioned in the February 2, 2015 submission, the construction and operation of the cell will be conducted in three separate phases. Each phase of operation will consist of the excavation and deposition of stabilized material in approximately one third of the total cell floor area. Each phase of operation will commence when the total allowable area for each one third of floor area has been filled with stabilized material. This design procedure was chosen to properly manage controlled volumes of precipitation. Fill rate for each phase of operation is currently estimated at one year based on current stabilization processes producing approximately 980 tonnes of bulk solid material per month with this volume steadily increasing from year to year. During the active life of the repository cell, the leachate collection system will manage precipitation that will enter the cell.

(b) location, storage capacity and the type of storage system

A sub drain system will be implemented in the cell floor design which will direct any leachate and precipitation to a pump out manhole covering a vertical collection conduit. The conduit will give access to a sump pump at the bottom of the conduit to extract and monitor leachate collected from the repository cell. For reference to the leachate collection system design and sump pit detail, it has been highlighted in yellow on AECOM's repository design drawings "C-0002" and "C-0003" (Refer to Appendix B). The leachate collection pump out manhole diameter is 3.94 ft. (1200 mm) with the vertical height measuring 20 ft. in length. The total length of weeping tile in the leachate collection system measures 896 ft. (273.1 m) with a 5 inch (150 mm) diameter sub drain pipe. The total storage capacity of the collection system is 10,577 L (leachate collection = 7,117 L, weeping tile = 3,460 L). Repository collection volumes will be managed as required after all precipitation events.

(c) proposed treatment including design and treatment capacity

Any leachate accumulated from the leachate collection system will not be used for repository dust control. Any collected leachate will be pumped out of the collection system and treated internally with processes facilitated on Miller's site. When required, clean water will be used for repository dust control.

(d) a diagram showing the location of all the components of the leachate management system and

As mentioned in (b) above, please refer to Appendix B for details on the leachate collection system components.

(e) if leachate is to be treated at the current treatment facility - provide details.

Any leachate accumulated from the leachate collection system will not be used for repository dust control. Any collected leachate will be treated internally with processes facilitated on Miller's site. When required, clean water will be used for repository dust control.

Please also clarify Miller proposes to handle leachate generated during the <u>severe precipitation events</u>?

As mentioned above in (a) and (b), the storage capacity of the leachate collection system is 10,577 L and volumes will be managed as required after all precipitation events. All collected leachate will be treated internally with processes facilitated on Miller's site.

Evaporator

Many separated wastewater streams can have high levels of glycol and low oil concentrations and cannot be used internally in Miller's stabilization process. These wastewater streams have historically been disposed externally to a licenced offsite deep well injection facility permitted to manage these wastes streams. Alternatively, if and when required, representative samples of the wastewaters are sent to an external lab. If the liquid filtrate meets sewer criteria (City of Winnipeg Sewer By-Law no. 92/2010), it is disposed externally to a wastewater treatment plant. Miller would like to propose the implementation of a wastewater evaporator to manage these wastewater streams to reduce offsite disposal volumes.

The proposed site location for the evaporator is Process Building 3 (PB3). PB3 currently has the following processing equipment:

- Aqueous tanks - Tank 12 (T12, 10,500 L), tank 13 (T13, 10,000 L)
- Container storage – 16 double stacked pallet spaces (820 L equivalents) = 13,120 L
- Filter press (2nd press) – for low level organic contaminated waste waters

PB3 is a fully contained room with a concrete berm. The concrete floor is sloped toward the center of the room to a blind sump (volume of 150 L). PB3's sloped floor is rated to contain a volume of 13,000 L. Any product spilled in PB3 can be washed down into the sump, removed with a vacuum truck or pump and managed at the facility. Please refer to Miller's facility map (Appendix C) for the location and layout of PB3.

The technical details of the evaporator are included in the ENCON Thermal Evaporator document (Refer to Appendix D). Some details of note are:

- Capacity of evaporator: 225 gallons at low level, 309 gallons at auto-run level, 359 gallons at high level
- Rate of evaporation/treatment: 96 gal/hr
- Refer to Appendix E for internal flow details of evaporated wastewater and how the combustion gases are mixed with the water vapor prior to the stack.
- Process Description: Wastewater streams intended to be put into the evaporator, but not limited to, are oily water & coolant from phase separation processes, rinse water collected from the pesticide container shredding process in process building 2 (PB2) (potentially contaminated with pesticides), neutralized wastewater and wastewater from Miller's filter press process in PB5. The evaporator will be able to manage over 500,000 L/year of wastewater and Miller's current wastewater volumes will support and exceed this rate. Wastewater will be transferred back and forth from PB1 to PB3 through a controlled valve and header system. When wastewater is not coming from PB1, it is transported to PB3 via means of containment or vacuum truck from other processing buildings. Tanks T12 & T13 situated in PB3 will be used to hold liquid waiting to be processed by the evaporator. When necessary, wastewaters will be run through the filter press (in PB3 or PB5) before being transferred into either T12 or T13 that will feed the evaporator. There will be a new piping system connecting the evaporator to tank 8 which will contain diesel to will fuel the evaporator. All wastewater placed into the evaporator will be batch processed. Each batch will be unique and will be initially analyzed by Miller's internal laboratory.
- Volume and Nature of Residue: It is anticipated that sludge residue will be pumped out of the cleanout flange. Any solid residue will be removed through the top access port via vacuum truck, manual processes, etc. Routine maintenance will include removal of residues that have

accumulated in the evaporator unit. All residues (both solid and sludge) removed will be put into appropriate packaging and will be analysed internally by the facility lab. Once analysed, residues will be processed internally or will be sent to an external disposal facility. Volumes of residue are unknown at this point as the percentage will vary from one wastewater to another. Feedback from ENCON Evaporators states the volumes put through the evaporator will be reduced by over 80% in volume with other customers getting up to 99% reduction of dilute wastewater as well. Miller predicts similar volume reduction rates in the same range of 80% to 99%.

- Air emission details: When activated, the burner(s) will fire into the combustion area of the heat exchanger. The hot gases travel around the vertical tubes inside the heat exchanger until they reach the insulated chimney outside the evaporator tank. The flue gases and water vapor are vented though a closed loop distillation unit – the hot gases are not pulled back into the evaporator. Instead, the flue gases are vented separately up their own exhaust stack. The blower pulls only the water vapor through the mist eliminator and pushes it through the connection from the blower exhaust to the inlet side of the condenser, which is horizontally mounted, on the backside of the evaporator tank. The water leaving the condenser is separated from the air stream and returned to the evaporator. The emissions from the evaporator will also depend on the wastewater. The evaporator will discharge water vapor through a mist elimination system and out of the building. The mist elimination system is designed to prevent entrained water droplets from exiting the system through the exhaust stack. In other words, the mist eliminator will remove non-volatile (liquid droplets) from the emission source. The gas phase emissions will then include water vapor and any material that is volatile at the boiling temperature of the evaporator. Prior to entering the evaporator, all wastewaters will be internally tested for VOC's by the facility lab.

New Building (Process Building 6 – PB6)

Miller is planning on constructing a new building (PB6) at the facility as soon as weather permits. PB6's footprint will be 80' x 100' and will be located southeast of Process Building 4 (PB4) (Refer to Appendix C). The purpose of PB6 will be to move two existing processes, the container washing and shredding processes, from different locations at the facility to provide a larger and heated work area. There are no process changes for both the container washing and shredding processes described below. Please refer to Appendix C for a building map of PB6.

PB6 will be split into two processing rooms. The north side will contain the shredding process and the south side will contain the container washing process. Concrete floors on both sides will be sloped 2 to 3 inches toward the center of the rooms to blind sumps (north side volume = 1,800 L, south side volume = 2,900 L). Any product spilled in PB6 can be washed down into the sumps, removed with a vacuum truck or pump and managed at the facility. A pony wall will separate the two sides with curbs constructed at the man doors but not overhead doors.

The first process that will be moved is the container washing facility. It is currently located outside the south overhead door of PB4. Containers that have been used to contain waste are sometimes suitable for reuse once emptied of their original contents. Before containers can be reused internally, containers are rinsed with hot water in order to dissolve and remove any residue. If residue cannot be removed, container is too odorous, or the container is too damaged for reuse, containers are either sent to the plastic shredding process or are crushed (if metal) and sent to an external recycler. The wash trailer collects all wastewater in a sump pit which gets pumped into a tote. The wastewater is then removed from the trailer and analysed internally by the facility lab. After analysis, the wastewater is treated internally with processes facilitated on Miller's site. Wastewater is not recycled in the container washing process. Miller has outgrown the current container washing facility. The volume of containers is continually increasing and it is time to move into a larger space. The container washing facility will be located in the south side of the building. It will also incorporate space for washing vehicles.

The second process that will be moved is the shredding process. The shredding process is currently located in PB2. Empty pesticide and oil containers along with various plastic containers (drums, pails, etc.) are put through the shredding process. Containers are emptied and residual liquids are consolidated into larger containers. Pesticide containers placed through the shredding process are rinsed once they have been shredded. Rinse water collected from the pesticide container shredding process (potentially contaminated with pesticides) is transferred to aqueous tanks to be processed with various reagents. Once processed, the rinse water is sent to a filter press for flocculated solid filtration and then put into aqueous tanks. The rinse water is analyzed by the lab. If it is determined to be of acceptable levels of pesticides, it is run through carbon and put into a mixer directly to the stabilization process. Oil containers put through the shredding process do not require rinsing prior to entering the shredder or after the containers have been shredded. Shredded plastic is collected in a hopper and consolidated into IBC bags. Shredded plastic is disposed externally to a recycler. Other plastic that does not require washing or is prewashed (drums, pails, etc.) is shredded with plastic disposed externally to a recycler. The shredding process will be located in the north side of the building. The reason for moving the shredding process into PB6 is to provide a heated environment for this process. Currently, there are process limitations with the cold weather being located in PB2.

If you have any questions about any of the three proposals listed above, please feel free to contact me at 204-925-9604 or by email at daveh@millerenvironmental.mb.ca.

Sincerely yours,
Miller Environmental Corporation

Dave Howes
Technical Services Coordinator

CC: Raj Rathanamo - Manitoba Conservation and Water Stewardship
Bruce Webb - Manitoba Conservation and Water Stewardship
Vaughn Bullough – Vice President & General Manager, Miller Environmental Corporation
Todd Normandeau – Projects Coordinator, Miller Environmental Corporation

Appendix A

Environment Canada Climate Normals 1981-2010

Climate Normals 1981-2010 Station Data - Source: Environment Canada Website (address below)

http://climate.weather.gc.ca/climate_normals/results_1981_2010_e.html?stnID=3630&lang=e&StationName=morris&SearchType=Contains&stnNameSubmit=go&dCode=0

Metadata including Station Name, Province, Latitude, Longitude, Elevation, Climate ID

Station Name: MORRIS 2, Province: MB, Latitude: 49°26'00.000" N, Longitude: 97°29'00.000" W, Elevation: 237.7 m, Climate_ID: 5021965

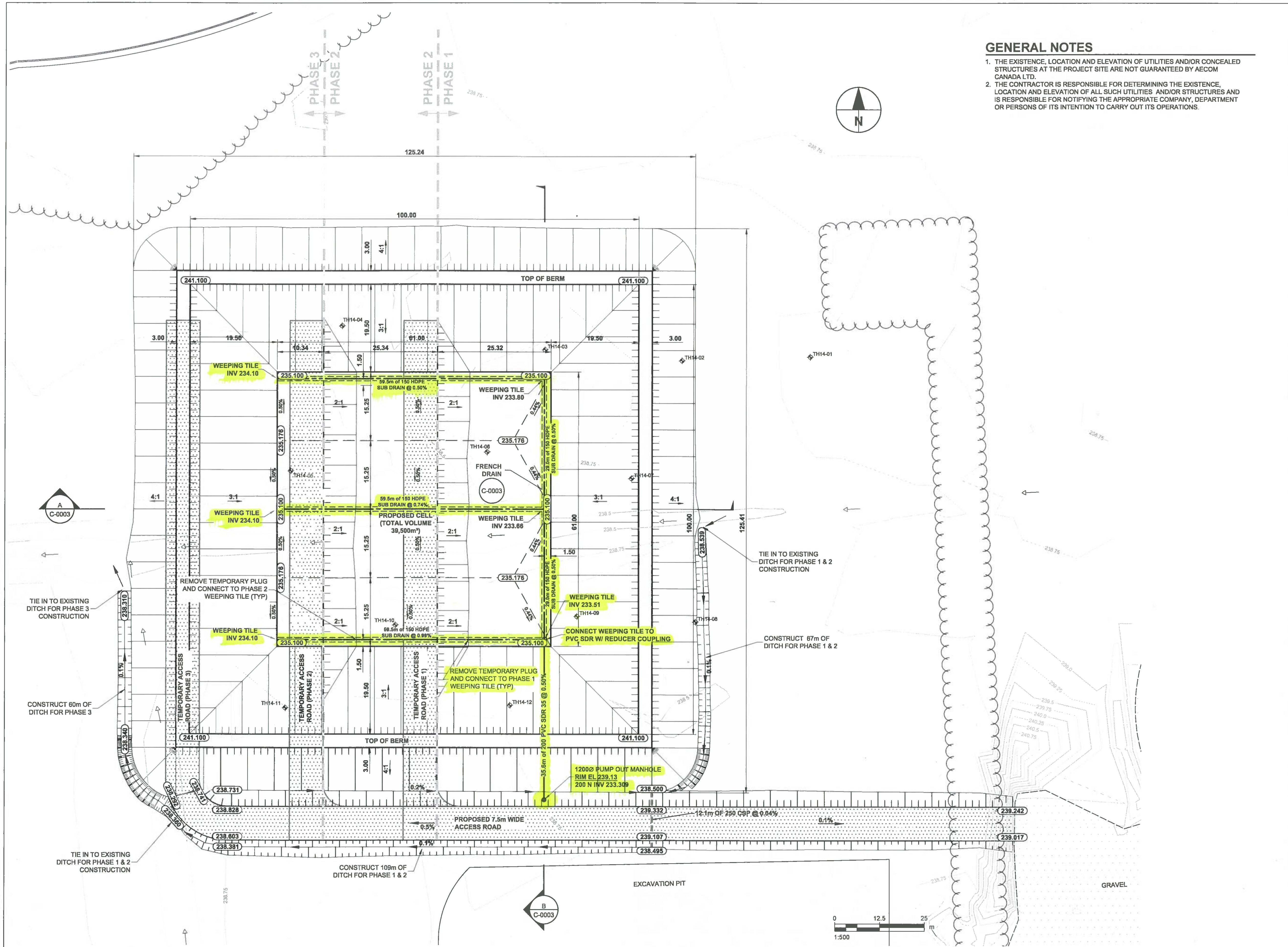
1981 to 2010 Canadian Climate Normals station data													
	Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Year**
Precipitation													
Rainfall (mm)	0	2.9	10.8	18.9	67.6	101.8	85.6	83.9	47.7	39.3	8	1.1	467.4
Snowfall (cm)	22.7	13.3	14.9	7.3	1	0	0	0	0	5.8	19.7	24.5	109.2
Precipitation (mm)	22.7	16.2	25.6	26.2	68.6	101.8	85.6	83.9	47.8	45.1	27.7	25.5	576.5
Average Snow Depth (cm)			0	0	0	0	0	0	0	0	0		
Median Snow Depth (cm)			0	0	0	0	0	0	0	0	0		
Extreme Daily Rainfall (mm)	0.5	25	32.8	35.3	51.3	79.2	92.2	93.4	67.2	77.2	30.2	16.4	
Date (yyyy/dd)	1963/07	2000/25	2004/27	1967/20	1974/20	1968/30	2001/26	1995/18	1978/12	1994/06	2000/06	1982/01	
Extreme Daily Snowfall (cm)	17	15	25.4	20.3	16.4	0	0	0	1	17.8	24	22	
Date (yyyy/dd)	1989/07	1996/09	1966/04	1966/26	1979/10	1961/01	1961/01	1961/01	1984/24	1971/30	1986/08	2006/30	
Extreme Daily Precipitation (mm)	17	25	56.8	35.3	51.3	79.2	92.2	93.4	67.2	77.2	30.2	22	
Date (yyyy/dd)	1989/07	2000/25	2004/27	1967/20	1974/20	1968/30	2001/26	1995/18	1978/12	1994/06	2000/06	2006/30	
Extreme Snow Depth (cm)	29	31	37	16	0	0	0	0	0	1	24	26	
Date (yyyy/dd)	1993/16	1995/28	1985/05	1999/04	1992/01	1991/01	1991/01	1991/01	1991/01	1997/31	1995/30	1995/31	
Days with Rainfall													
>= 0.2 mm	0.12	0.4	2.5	5.4	11.4	14.1	12.9	11.2	10.8	7.8	1.8	0.25	78.6
>= 5 mm	0	0.16	0.73	1.4	4	5.8	4.4	3.8	2.7	2.2	0.54	0.04	25.7
>= 10 mm	0	0.08	0.31	0.54	2.3	3.3	2.7	2.1	1.4	1.2	0.23	0.04	14.3
>= 25 mm	0	0.04	0.04	0	0.54	0.74	0.85	1	0.22	0.2	0.04	0	3.7
Days With Snowfall													
>= 0.2 cm	9.8	5.8	5.3	1.7	0.31	0	0	0	0.04	1.6	5.5	8.9	38.9
>= 5 cm	1	0.65	0.85	0.62	0.08	0	0	0	0	0.48	1.2	1.4	6.3
>= 10 cm	0.17	0.22	0.31	0.27	0.04	0	0	0	0	0.12	0.58	0.45	2.2
>= 25 cm	0	0	0	0	0	0	0	0	0	0	0	0	0
Days with Precipitation													
>= 0.2 mm	9.8	6.1	7.5	6.7	11.7	14.1	12.9	11.2	10.8	9	6.9	9.1	115.7
>= 5 mm	1	0.83	1.5	1.9	4.1	5.8	4.4	3.8	2.7	2.7	1.7	1.5	31.8
>= 10 mm	0.17	0.3	0.62	0.85	2.4	3.3	2.7	2.1	1.4	1.4	0.77	0.5	16.5
>= 25 mm	0	0.04	0.04	0	0.54	0.74	0.85	1	0.22	0.24	0.04	0	3.7
Days with Snow Depth													
>= 1 cm			0	0.7	0	0	0	0	0	0.1	2		
>= 5 cm			0	0.3	0	0	0	0	0	0	1		
>= 10 cm			0	0.2	0	0	0	0	0	0	0		
>= 20 cm			0	0	0	0	0	0	0	0	0		

Appendix B

AECOM Repository Design – C-0002 & C-0003

GENERAL NOTES

1. THE EXISTENCE, LOCATION AND ELEVATION OF UTILITIES AND/OR CONCEALED STRUCTURES AT THE PROJECT SITE ARE NOT GUARANTEED BY AECOM CANADA LTD.
2. THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE EXISTENCE, LOCATION AND ELEVATION OF ALL SUCH UTILITIES AND/OR STRUCTURES AND IS RESPONSIBLE FOR NOTIFYING THE APPROPRIATE COMPANY, DEPARTMENT OR PERSONS OF ITS INTENTION TO CARRY OUT ITS OPERATIONS.



AECOM

PROJECT
Repository Cell

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Miller Environmental Corporation
Manitoba

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www.aecom.com

REGISTRATION

PROVINCE OF MANITOBA K.W. FITCHETT REGISTERED PROFESSIONAL ENGINEER July 24/14

APEGM Certificate of Authorization
AECOM Canada Ltd.
No. 4671 Date: July 24/14

ISSUE/REVISION

I/R	DATE	DESCRIPTION
A	2014/07/24	ISSUED FOR ENVIRONMENTAL APPROVAL

KEY PLAN

PROJECT NUMBER
60216914

SHEET TITLE
REPOSITORY CELL
CELL PHASING, ACCESS ROAD AND SITE GRADING

SHEET NUMBER
C-0002

ANSI D 864mm x 559mm
Project Management Initials: Designer: Checked: Approved:
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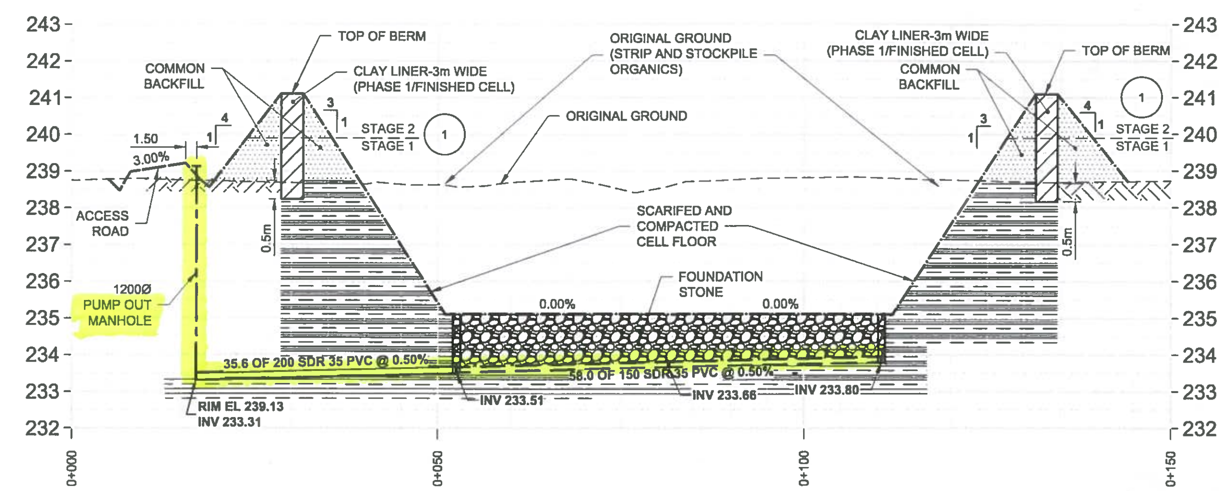
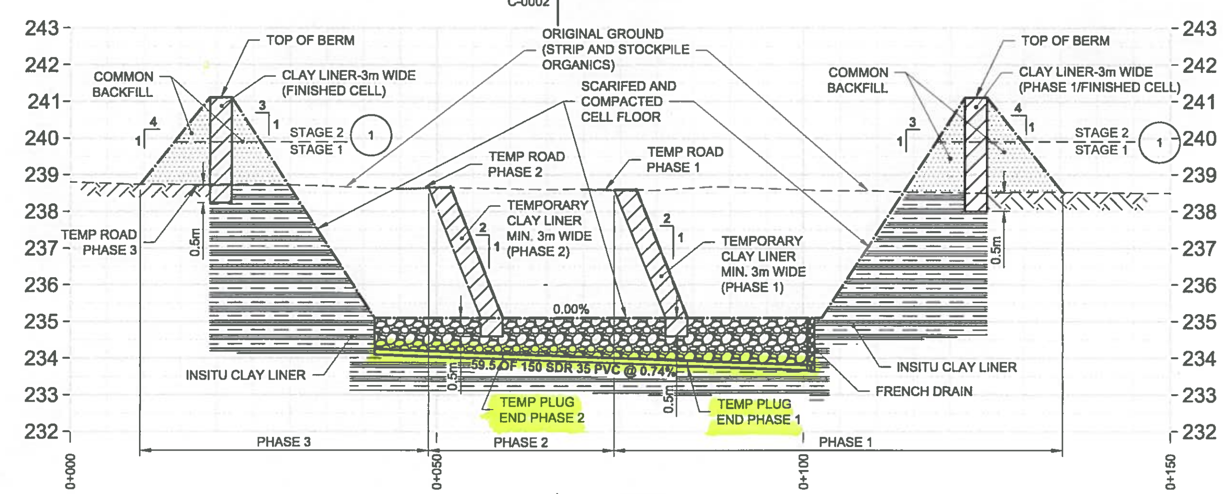


A SECTION
C-0002



B SECTION
C-0002

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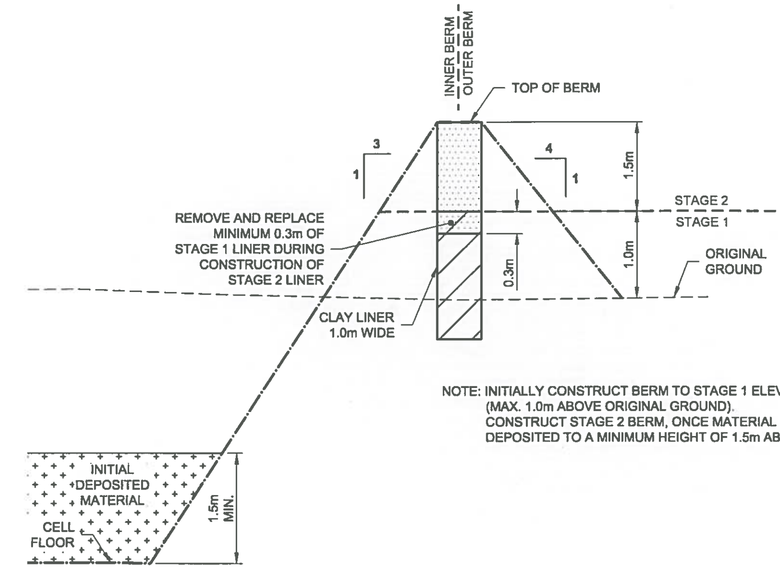
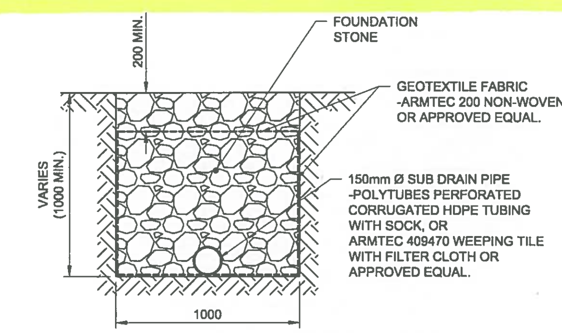
V=1:50



NOTE: INITIALLY CONSTRUCT BERM TO STAGE 1 ELEVATION (MAX. 1.0m ABOVE ORIGINAL GROUND). CONSTRUCT STAGE 2 BERM, ONCE MATERIAL HAS BEEN DEPOSITED TO A MINIMUM HEIGHT OF 1.5m ABOVE THE CELL FLOOR.

1 BERM STAGING DETAIL
C-0003

Scale NTS

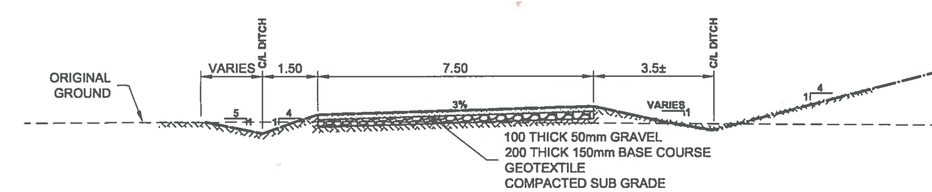


NOTE: FOUNDATION STONE SHALL BE NATURAL OR MANUFACTURED, CLEAN, ANGULAR, OPEN GRADED, GRANULAR MATERIAL WITH THE FOLLOWING GRADATION:

19mm SEIVE 100% PASSING
12.5mm SEIVE 0% - 5% PASSING

SUMP PIT DETAIL

Scale NTS



ACCESS ROAD SECTION

N.T.S.

CONSTRUCTION NOTES:

1. ADVISE ENGINEER SUFFICIENTLY IN ADVANCE OF EXCAVATION OPERATIONS FOR INITIAL CROSS-SECTIONS TO BE TAKEN.
2. STRIPPING OR REMOVAL OF TOPSOIL IS REQUIRED FOR THE AREA OF THE CELL(S) FLOOR AND AS DIRECTED ONSITE BY THE ENGINEER.
3. EXCAVATE CELL AREA TO LINES AND GRADES INDICATED. SLOPE THE CELL FLOOR AT THE END OF WORK EACH DAY TO ENSURE THERE IS A SUMP AREA FOR DRAINAGE IN THE EVENT OF A RAINFALL.
4. THE ENGINEER WILL DETERMINE IF THE VISIBLE CELL FLOOR BOTTOM IS THE TOP SURFACE OF THE LINER OR THE LINER TOP SURFACE IS BELOW THE CELL FLOOR. COMPLETE THE FOLLOWING WORKS TO CELL FLOOR WHERE IT IS THE TOP SURFACE OF THE LINER AS A MINIMUM AS DETERMINED BY ENGINEER.
   4.1 ENGINEER SHALL DETERMINE IF CELL BOTTOM IS SUITABLE AS CLAY LINER MATERIAL
   4.2 IF DIRECTED BY ENGINEER REMOVE UNSUITABLE MATERIAL AND REPLACE WITH CLAY TYPE SOIL TO LATERAL LIMITS AND DEPTHS DIRECTED. PLACE AND COMPACT IN ACCORDANCE WITH EMBANKMENT CONSTRUCTION
   4.3 UNSUITABLE MATERIALS EXCAVATED TO BE DISPOSED OF AS DIRECTED BY ENGINEER, EITHER STOCKPILED, PLACED IN WINDROWS OR PLACED ON OUTSIDE OF DIKE EMBANKMENT.
5. SCARIFY ENTIRE FLOOR TO 300mm AND COMPACT TO 95% STANDARD PROCTOR DENSITY.
6. COMPACT EMBANKMENT AND CONSTRUCTED LINERS TO 95% STANDARD PROCTOR DENSITY. LINER TO BE CONSTRUCTED OF MEDIUM PLASTIC CLAY WITH PERMEABILITY OF LESS THAN 1×10^{-7}.
7. DO NOT COMPLETE SCARIFYING AND COMPACTION OF CELL FLOOR UNTIL ALL EXCAVATION FOR EMBANKMENT AND LINER CONSTRUCTION HAS BEEN COMPLETED.
8. CONSTRUCT DITCHES TO DEPTHS AND WIDTHS INDICATED OR AS DIRECTED BY ENGINEER.

CONSTRUCTION NOTES (con't):

9. MAINTAIN AND KEEP DITCHES OPEN AND FREE FROM DEBRIS.
10. REMOVE SOFT AND OTHER UNSTABLE MATERIAL THAT WILL NOT COMPACT PROPERLY AND FILL RESULTIN DEPRESSIONS WITH APPROVED MATERIAL. REMOVE ROCKS OR STONES IN EXCESS OF 75mm FROM SURFACE.
11. SHAPE AND COMPACT ENTIRE BOTTOM OF CELL TO WITHIN 50mm OF DESIGN ELEVATIONS BUT NOT UNIFORMLY HIGH OR LOW.
12. FINISH TOP AND SIDE SLOPES OF DIKES OR BERMS TO WITHIN 50mm OF DESIGN ELEVATIONS
    11.1 REMOVE BOULDERS WITHIN 300mm OF EXPOSED SURFACE AND FILL RESULTING CAVITIES
    11.2 HAND FINISH SLOPES THAT CANNOT BE FINISHED SATISFACTORILY BY MACHINE
13. DISPOSE OF SURPLUS MATERIAL NOT REQUIRED FOR FINE GRADING AND LANDSCAPING OR EMBANKMENT CONSTRUCTION AS DIRECTED BY ENGINEER.
14. TRIM AND SHAPE ALL SURPLUS MATERIAL IN THE PILE AFTER CONSTRUCTION IS COMPLETE. IN GENERAL THE STOCKPILE MUST BE ABLE TO BE MAINTAINED BY MOWING EQUIPMENT. OBTAIN ENGINEER'S APPROVAL OF FINAL SHAPE.
15. TOPSOIL & SEED EXISTING DIKE TOPS & SIDESLOPES. RE-USE EXISTING TOPSOIL FROM THE SITE. SEED MIXTURE RATIO TO BE APPROVED BY THE ENGINEER.
16. SEE GEOTECHNICAL REPORT FOR TEST HOLE LOGS AND ANALYSIS.

AECOM

PROJECT
Repository Cell

CLIENT
Miller Environmental Corporation
Manitoba

CONSULTANT

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REGISTRATION

PROVINCE OF MANITOBA
K.W. FITCHETT
REGISTERED PROFESSIONAL ENGINEER
July 24/14

AECOM
Certificate of Authorization
AECOM Canada Ltd.
No. 4671 Date: July 24/14

ISSUE/REVISION

I/R	DATE	DESCRIPTION
A	2014/07/24	ISSUED FOR ENVIRONMENTAL APPROVAL

KEY PLAN

PROJECT NUMBER
60216914

SHEET TITLE
REPOSITORY CELL CROSS SECTIONS AND DETAILS

SHEET NUMBER
C-0003

ANSI D 864mm x 559mm
Approved: ____ Checked: ____ Designer: ____ Project Management Initials: ____

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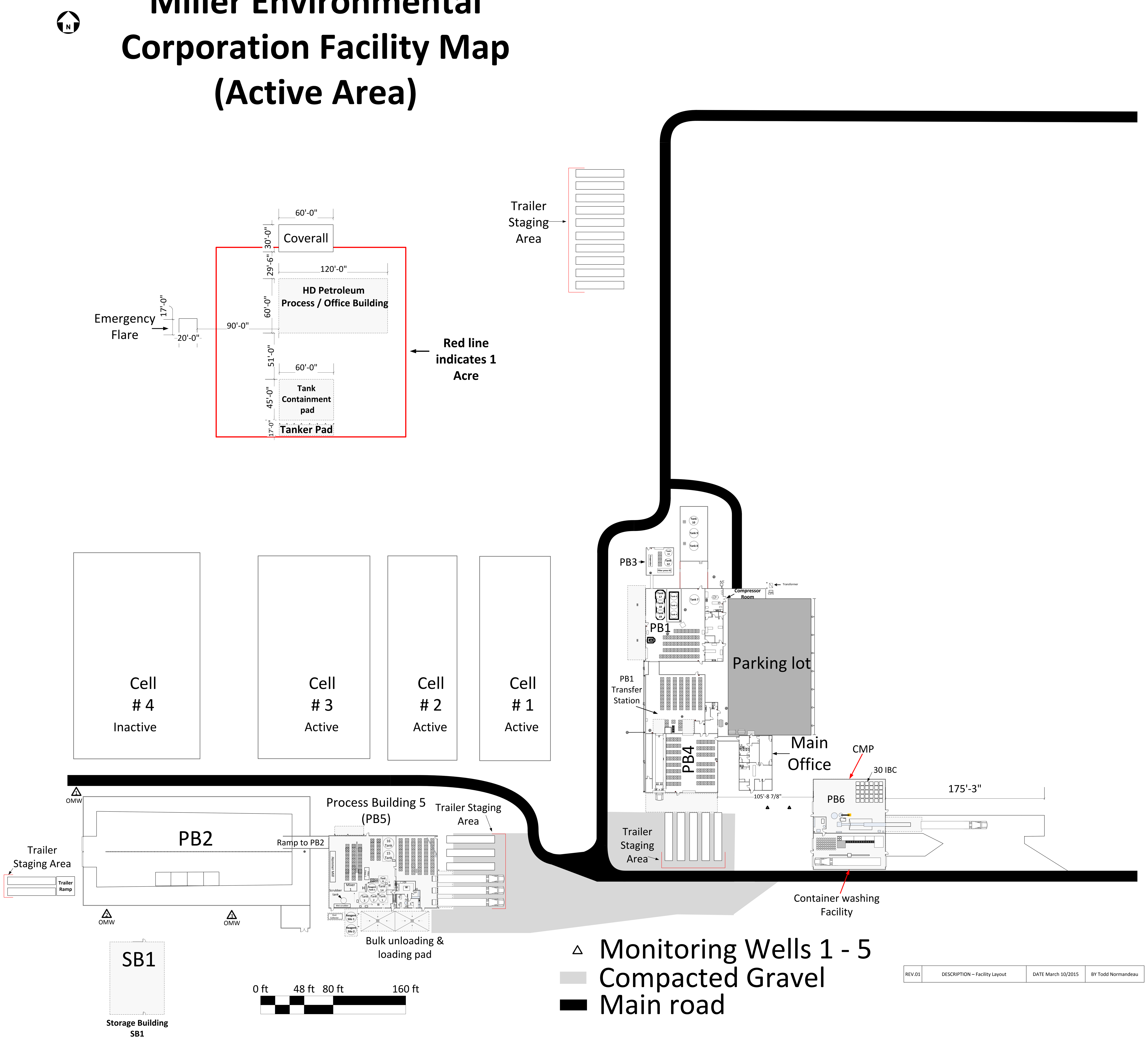
Appendix C

Facility Map

Miller Environmental Corporation Facility Map (Active Area)



Appendix D

ENCON Thermal Evaporator Specifications

Project	Item Number	Quantity
____________________________	__________________________	______________

OxxV2-96

THERMAL EVAPORATOR

MADE IN THE USA

OxxV2-96

ENCON Thermal Evaporator

- Handles Different Wastewater Streams Simultaneously
- Dramatically Reduces Disposal Volume and Cost
- Eliminates Need to Discharge Wastewater
- Easy to Install and Operate

ENCON Thermal Evaporators and Distillation Systems are engineered to provide you with an effective and economical method of wastewater minimization. All ENCON systems are assembled with the highest quality components, ensuring years of trouble free operation.

Our unique heat exchanger design provides extremely efficient heat transfer, resulting in reduced fuel costs.

Key to the effectiveness of ENCON evaporation systems is the mist eliminator. This feature of the ENCON design captures unwanted contaminants before exhausting, thus enabling you to comply with today's stringent emissions regulations (evaporation) or to return high quality water to your process (distillation).

Put Our Engineering and Regulatory Expertise to Work for You!

ENCON Evaporators provides the following services relative to evaporation/distillation projects:

- Free wastewater qualification analysis to ensure application feasibility
- Regulatory compliance and paperwork
- System design and compliance for hazardous waste applications
- PLC programming to optimize system automation
- Closed loop recycling evaluation and analysis

Model Number Nomenclature

O32V2-96: First character equals heat source, in this case #2 fuel oil.

O**3**2V2-96: Second character indicates the evaporation tank material of construction, in this case 316ss.

O3**2**V2-96: Third character indicates the heat exchanger material of construction. In this case it is Hastelloy C.

O32**V2**-96: Fourth & fifth character indicates the type of control unit. In this case it is the version 2 logic and controls.

O32V2-**96**: The last character indicates evaporation rate based on tap water. In this case it is 96 gallons per hour.

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ENCON OxxV2-96 SPECIFICATIONS

PHYSICAL	EVAPORATION UNIT	DISTILLATION UNIT
Dimensions :	158” x 52” x 108” (L x W x H)	158” x 72” x 100” (L x W x H)
Weight (Empty):	3100 lbs (empty) / 3650 lbs (crated)	3650 lbs (empty) / 4200 lbs (crated)
Condenser Size:	N/A	8”∅ x 30”L (3” FNPT chill water fittings)
Vent Stack Diameter:	10” OD	8” OD
Blower Volume:	1600 CFM, 3 HP, Variable Frequency Drive (1750 – 3450 RPM)	
Inlet Pipe Diameter:	Fluid - 1” FNPT	
Cleanout Diameter:	6” Flanged Cap with 1.5” FNPT fitting	
Heat Exchanger:	Elevated with Cylindrical Firing Chamber	
Tank Capacity:	225 gallons @ Low level, 309 gallons @ Auto-run level, 359 gallons at High level	
Tank Bottom:	5° downward slope to a 6” cleanout flange	

UTILITIES	EVAPORATION UNIT	DISTILLATION UNIT
Burner Type:	Direct Spark Ignition with FM Gas Train	
Burner Throughput:	1,040,000 BTU/hr	
Oil Consumption:	7.40 gallons/hour of #2 fuel oil	
Electric Requirements:	480 VAC, 3 Phase, 30 Amps (240V available)	
Cooling Water:	N/A	120 gallons per minute @ 90°F (68 tons)

FABRICATION	316SS VERSION	6% MOLY VERSION	HASTELLOY VERSION
Tank:	316L Stainless, 14 ga	6% Molybdenum, 14 ga	Hastelloy, 14 ga
Heat Exchanger:	316L Stainless, 11 ga	6% Molybdenum, 11 ga	Hastelloy, 11 ga
Mist Eliminator Pad:	316L Stainless		
Skins and Lids:	Polished 304 Stainless Steel, 18 ga		
Insulation:	All 6 sides, rated to 450F, R = 4.3		

CONTROLS	ALL UNITS
Burner Controller:	Honeywell with Spark Ignition, loss of airflow shutdown
Temperature Controls:	Four (4) channel analog card with 2 Type J Thermocouples: Fluid Concentration Monitoring & Air Intake/Redundant Low Level Shut-off
Control Inputs:	3 Frequency Shift Level Probes and Mist Pad Differential Pressure Transducer
Remote Connection:	Ethernet port for direct connection by ENCON Engineers
Control Panel:	UL Listed, NEMA 4, PLC Control Panel
	Touch screen Operator Interface Display with messages for normal & alarm conditions.
	Main power selector switch
	Indicators (2) – Main Power, Burner(s)

QUALITY	ALL UNITS
Pressure Test:	Pressure leak test performed on every heat exchanger
Leak Test:	Dye penetrant test performed on tank welds
I/O Simulation:	All I/O and controls are fully tested to insure accuracy/functionality
Combustion Analysis:	Test for excess oxygen and gas exit temperature
Warranty:	Two Year for Parts and Workmanship Issues

Specifications subject to change without notice.

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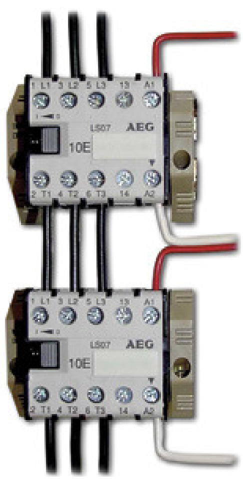
PLC Control Panel
NEMA 4 PLC touch screen control panel provides readout of wastewater and heated air temperature, mist pad pressure, plus alarm and operating conditions for maximum operator feedback. The panel also includes a built-in cycle timer.

Built-in Ethernet Connection
Every control panel has a built-in Ethernet connection. This allows for easy remote monitoring and/or troubleshooting of the system by ENCON personnel.



Level Sensing
Tuning fork level probes provide reliable auto-filling and shutdown operations even in conditions of severe foam. The durable level probes are made of stainless steel for excellent corrosion resistance. Hastelloy level probes are available for highly corrosive applications.

Redundant Burner Contactors
Each burner has a duty contactor and a redundant contactor. This design ensures maximum safety by opening the redundant contactor in the event the duty contactor should fail electrically or mechanically.

Blower System
1725 RPM, TEFC motor with class B insulation rated for high temperatures. The unit's design provides extremely quiet operation and as much as three times the longevity of 3450 RPM motors. Heavy gauge aluminum blower provides durability and longevity.

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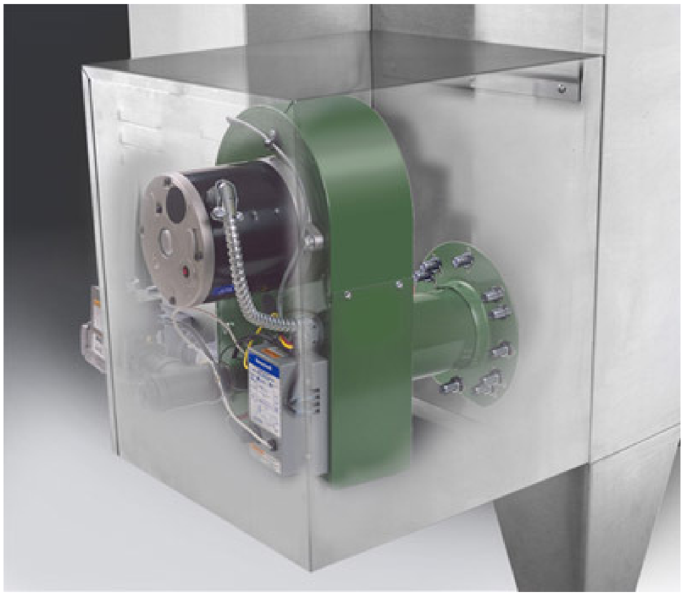

Forced Draft Blower
Each fuel-heated system consists of a burner with:

- Honeywell controls
- Pressure gauge and gas volume meter for monitoring gas inlet conditions
- Airflow detection and lockout
- Spark ignition
- Redundant main valve and burner contactors for maximum safety

FM gas trains and gas flow transmitters are standard on larger systems. The stainless steel burner protection shroud is mounted on a track hanger for ease of removal and reattachment. Natural gas, Propane, Duel fuel, Oil, Diesel, Waste oil and low NO_x burners are available.

Mist Eliminator System
The stainless mesh filter is designed for easy removal from its compression fir housing. The system is monitored for contaminant loading and airflow, which is interfaced to the control panel for maximum operator feedback.

Cleanout Flange
Large six inch cleanout with flange cover and a 1 ½" NPT fitting for pump connection and ease of residue removal.

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PROCESS DESCRIPTION OF GAS/OIL FIRED ENCON EVAPORATORS

1. Wastewater is collected in a primary holding tank/sump.

2. Water is either pumped or gravity fed into the evaporator through a 1" NPT fitting on lid.

3. The three (3) level controls in the standard auto-fill system provide the following:
   a) The low level controls the burner(s) operation (on/off).
   b) The auto-run level controls water level in tank when in auto run mode.
   c) The high level acts a redundancy to the auto-run level.

4. As the fluid flows into the evaporator and reaches the low level, the burner(s) will light.

5. Fluid will continue to flow until it reaches the auto-run level. The feed pump or actuated ball valve will be de-energized/closed.

6. As the fluid comes to a boil and begins the evaporation process, the liquid level will drop below the auto-run level. The feed pump or actuated ball valve will be energized and more fluid will be fed into the Evaporator based on a timed cycle controlled by the PLC and the auto run probe until it reaches the auto-run level.

7. This process will continue until either the fluid temperature reaches the high set point or the optional cycle timer counts down to zero.

8. When activated, the burner(s) will fire into the combustion area of the heat exchanger. The hot gases travel around the vertical tubes inside the heat exchanger until they reach the insulated chimney outside the evaporator tank. There are two ways the flue gases and water vapor may be vented:

   a) If the customer has chosen an Evaporation Unit (vent to atmosphere), the hot gases are pulled back into the Evaporator above the liquid level and drawn across the water's surface by the exhaust blower. The exhaust blower pulls the combined water vapor and flue gases through the mist eliminator and pushes them through the stack to the outside of your building.

   b) If the customer has chosen the "closed loop" Distillation Unit (condenser package), the hot gases are not pulled back into the Evaporator. Instead, the flue gases are vented separately up their own exhaust stack. The blower pulls only the water vapor through the mist eliminator and pushes it through the connection from the blower exhaust to the inlet side of the condenser, which is horizontally mounted, on the backside of the evaporator tank. The water leaving the condenser is separated from the air stream and directed to an automated condensate sump while the air stream is returned to the evaporator.

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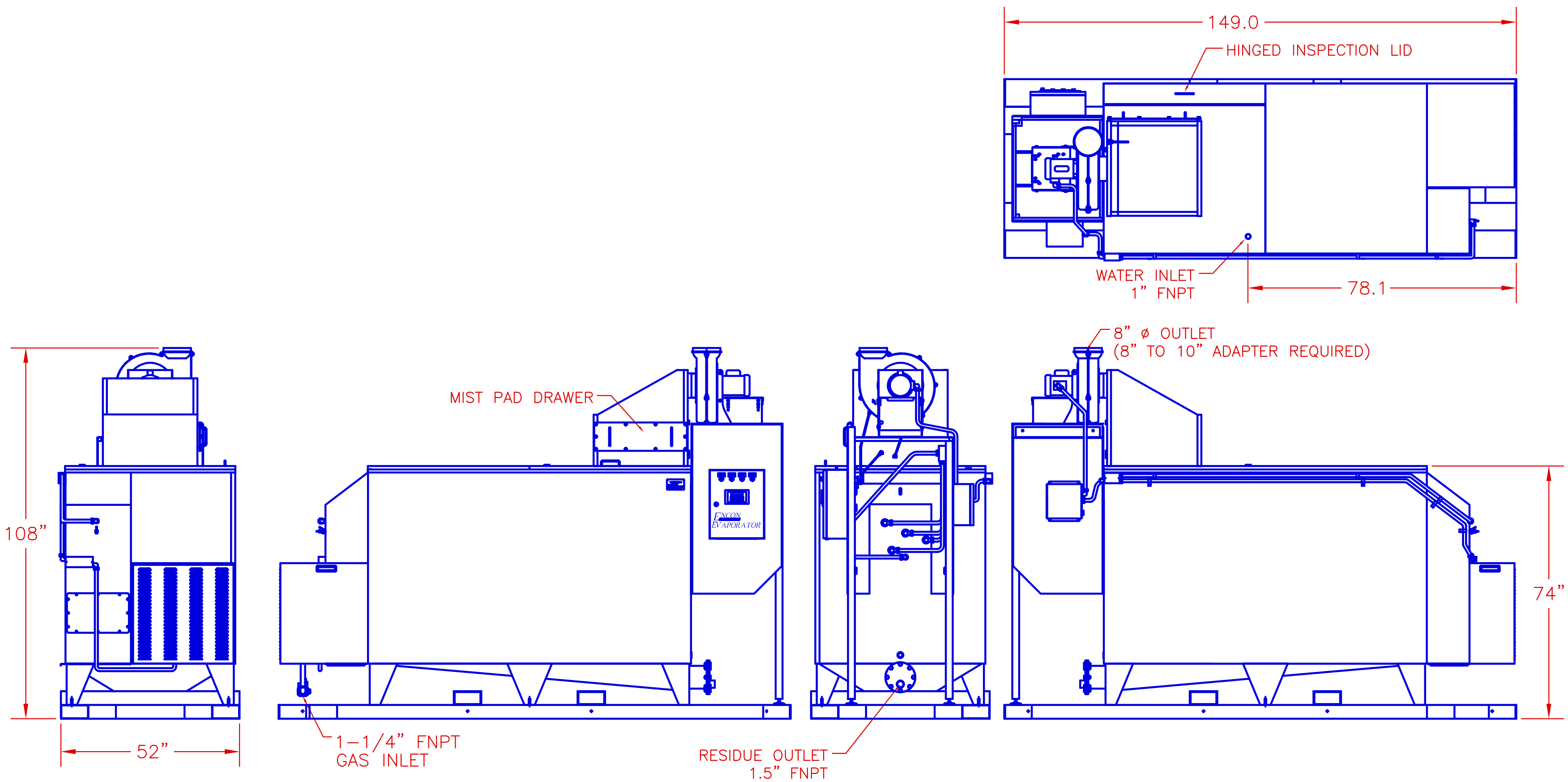
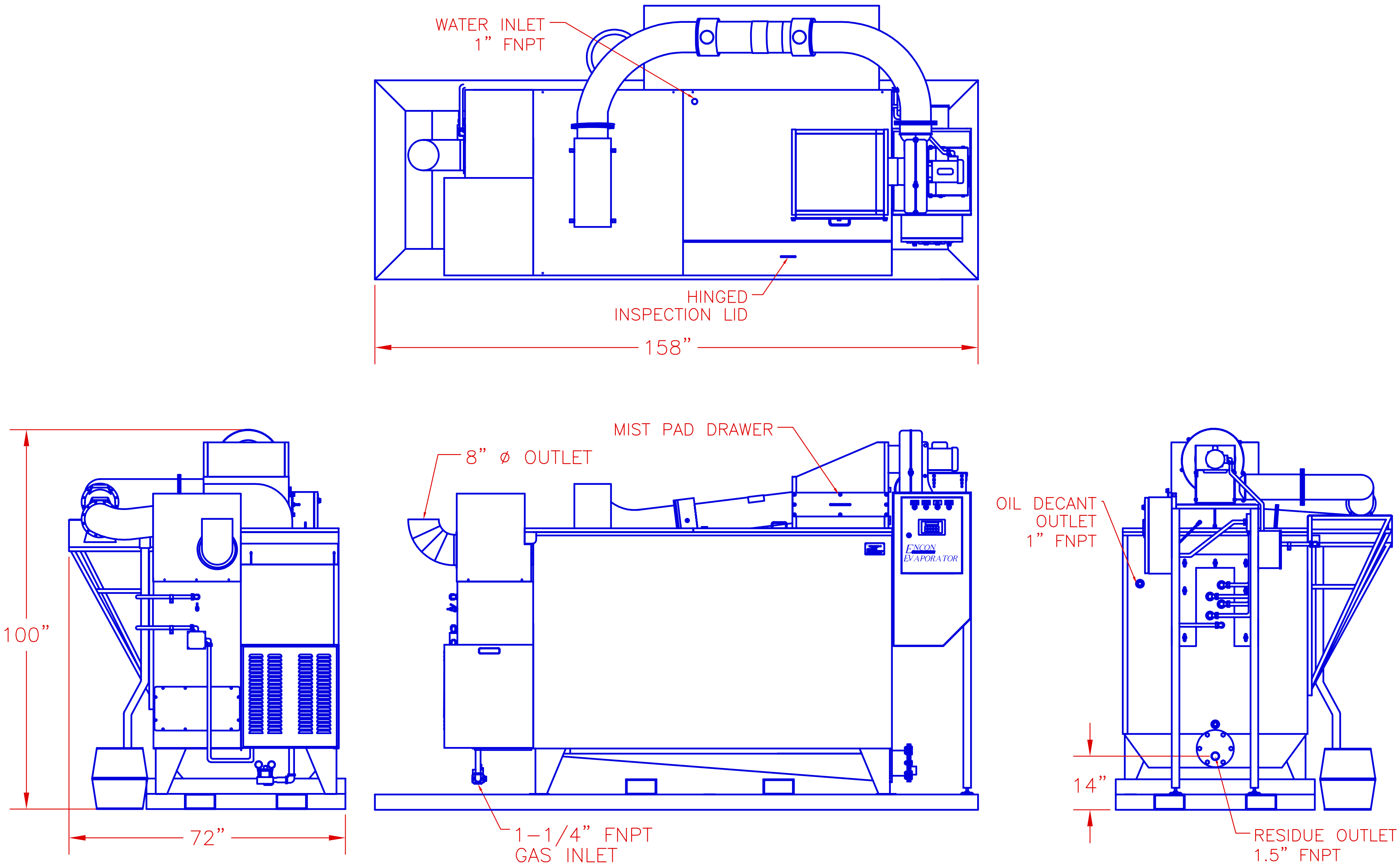


APPROVED	JPC	10/16/02	PART NAME: N/Pxxx-96 EVAPORATION UNIT LAYOUT			
ENCON EVAPORATORS 97 Eddy Rd. Unit 6 Manchester, NH 03102 **CONFIDENTIAL**			PART NUMBER: 3000490	REV 02	SCALE NTS	SHEET 1 OF 1
			UNLESS OTHERWISE SPECIFIED: X.XXXX = ±.0005 X.XXX = ±.005 X.XX = ±.015 X.X = ±.030 DRESS AND DEBURR ALL SHARP CORNERS AND EDGES	MACHINED FINISHES = .250 ∠ = 0° - 30° THREADS = CLASS 2 UNIFIED SERIES		
			DO NOT SCALE DRAWING	FORMAT A		



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ENCON EVAPORATORS

97 Eddy Rd. Unit 6
Manchester, NH 03102

CONFIDENTIAL

PART NAME:
N/Pxxx-96 DISTILLATION UNIT LAYOUT

PART NUMBER:	REV	SCALE	SHEET
3000835	02	NTS	1 OF 1

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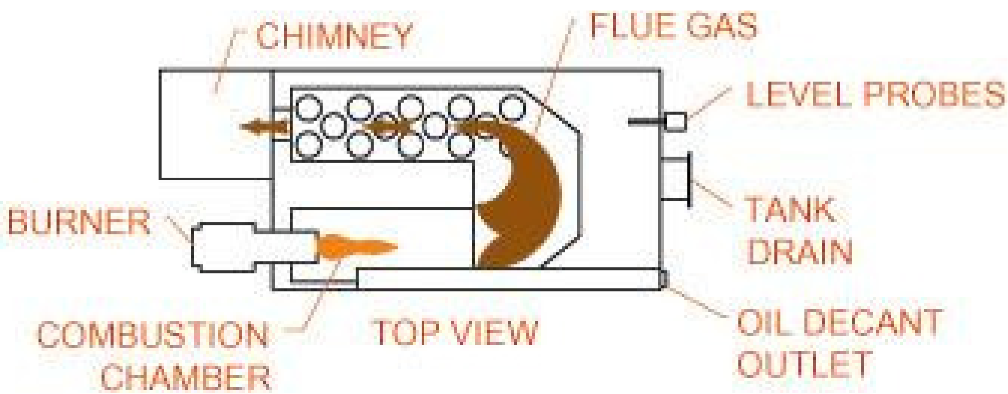
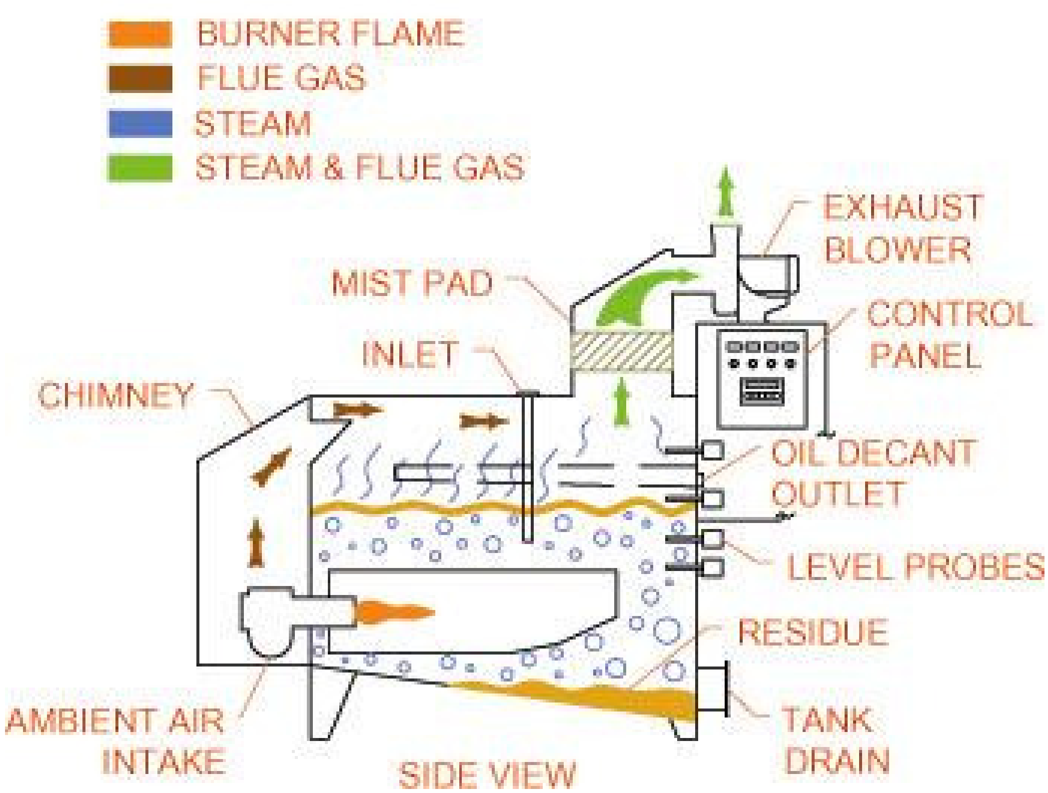
Appendix E

ENCON Evaporator Flow Diagram

Flow Diagram
ENCON Gas Evaporator





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