

4792

**RENEWAL OF PERMITS TO OPERATE AT THE
FERNALD ENVIRONMENTAL MANAGEMENT
PROJECT OEPA ID NOS. 1431110128 T096, T097,
T098, T099 AND T100**

09/28/93

**C:RP:93-0166
FERMCO/OEPA
26
PERMIT AP**



Restoration Management Corporation P.O. Box 398704 Cincinnati, Ohio 45239-8704 (513) 738-6200

September 28, 1993

U. S. Department of Energy
Fernald Environmental Management Project
Letter No. C:RP:93-0166

Mr. Peter Sturdevant
Compliance Specialist
Hamilton County Department
of Environmental Services
Air Quality Management Division
1632 Central Parkway
Cincinnati, Ohio 45210

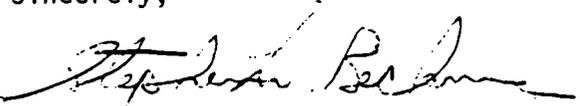
Dear Mr. Sturdevant:

**RENEWAL OF PERMITS TO OPERATE AT THE FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
OEPA ID. NOS. 1431110128 T096, T097, T098, T099 AND T100**

Enclosed please find the renewal applications for five FEMP storage tanks for which the Permits to Operate are scheduled to expire in December 1993. A check for \$75.00 is enclosed to cover the application fees.

Please contact Kip Klee of my staff at 738-8640 if you have any questions about these applications.

Sincerely,


Kenneth L. Alkema
Vice President
Regulatory Programs

KLA:KOK:mhv
Attachments

- cc: S. M. Beckman, FERMCO - w/o attachments
- R. W. Bischoff, FERMCO - w/o attachments
- Robert Mendelsohn, DOE Contract Specialist
- P. B. Spotts, FERMCO - w/o attachments
- W. J. Quaid, DOE- FN
- AR Coordinator
- PR Files (PTOs T096-T099) - w/o attachments
- File Record Storage Copy 108.6

4792

OHIO ENVIRONMENTAL PROTECTION AGENCY
APPLICATION FOR A PERMIT TO OPERATE
AN AIR CONTAMINANT SOURCE

D.O.E.-Fernald Environmental Management
Facility Name Project

Mr. Stephen M. Beckman
Person to Contact

7400 Willey Road
Facility Address

Post Office Box 398704
Mailing Address

Fernald Hamilton 45030
City County Zip

Cincinnati OH 45239-8705
City State Zip

513/ 738-6502
Telephone Area Number

513/ 738-6502
Telephone

#1431110128-T096
(Application no., if this is a renewal application)

4953
Std. Ind. Class. Code

1. Complete and attach any of the following appendices most appropriate to the air contaminant source. In addition, a compliance time schedule form is to be attached when applicable. Check as appropriate the following:

- | | |
|--|---|
| <input type="checkbox"/> Appendix A, Process | <input type="checkbox"/> Appendix L, Solvent Metal Cleaning |
| <input type="checkbox"/> Appendix B, Fuel-Burning Equipment | <input type="checkbox"/> Appendix M, Fugitive Dust Emission Sources |
| <input type="checkbox"/> Appendix C, Incinerator | |
| <input type="checkbox"/> Appendix D, Surface Coating or Printing Operation | |
| <input checked="" type="checkbox"/> Appendix E, Storage Tank | Specify Appendix No. |
| <input type="checkbox"/> Appendix H, Gasoline Dispensing Facility | <input type="checkbox"/> Appendix N, Rubber Tire Manufacturing |
| <input type="checkbox"/> Appendix J, Loading Rack at Bulk Gasoline Plant or Terminal | <input type="checkbox"/> Appendix O, Dry Cleaning Facility |
| <input type="checkbox"/> Appendix K, Surface Coating Line or Printing Line | <input type="checkbox"/> Appendix P, Landfills |
| | <input type="checkbox"/> Other Appendix _____ |
| | <input type="checkbox"/> Compliance Time Schedule |

2. Description of Source (same as used on appendix): Filtrate Receiver Tank

3. Your identification for Source (same as used on appendix):
Filtrate Receiver Tank 735-43-21A - FEMP Id. # 8-024

I, being the individual specified in Rule 3745-35-02(B) of the Ohio Administrative Code, hereby apply for a Permit to Operate the air contaminant source(s) described herein. As required, the following additional documents are submitted as part of this application (describe all attachments):

- (1) Appendix E-2
- (2) Emissions Estimate


 Authorized Signature
 Kenneth L. Alkema
 Vice President Regulatory Programs
 Title

10/4/93
Date

*Pursuant to OAC Rule 3745-35-02(B) (Permit to Operate).

0002

Premise No. ___/___/___/___
Source No. ___/___
Application No. ___/___

DOE - FEMP
(Facility Name)

APPENDIX E-2

INORGANIC MATERIAL STORAGE TANK OR
STORAGE TANK WITH CAPACITY LESS THAN 40,000 GALLONS

- 1. Tank identification: Name or number Filtrate Receiver Tank Date Installed 1955
735-43-21A (T096) (month/year)
- 2. Tank capacity: 8,225 gallons
- 3. Tank shape: Cylindrical Rectangular
 Spherical Other, specify _____
- 4. Tank dimensions: Diameter 10 ft. Height 14 ft. Length ----- Width -----
- 5. Tank shell material: Steel Aluminum Other, specify 304 SS
- 6. Type of tank: External floating roof tank
 Internal floating roof tank
 Fixed roof tank
 Vertical cylindrical tank
 Horizontal cylindrical tank
 Pressure tank
 Other, specify _____
- 7. Location of tank: Outdoors Indoors Underground
- 8. Type of filling: Splash Submerged Other, specify _____
- 9. If this tank is located outdoors and above ground, provide the paint color of the tank
 Aluminum (specular) Light gray White
 Aluminum (diffuse) Medium gray Other, specify 304 SS
- N/A Condition of paint: Good Poor
- 10. If this tank is equipped with or vented to a vapor control system, complete (a) through (c) of this item.
N/A
 - a) Type of vapor control system _____
Manufacturer _____ Make or model _____
Date installed (month and year) _____
 - b) Date tank was equipped with or vented to vapor control system (month & year) _____
 - c) Specify the rate of emission or percent control (by weight) for any pollutants being controlled: _____
(Attach calculations and test data to support response, unless previously submitted.)

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DOE - FEMP
(Facility Name)
735-43-21A (8-024)
(tank identification)

11. Complete the table below for any pressure or vacuum relief vent valve.
N/A

Type of Vent Valve	Pressure Setting	Vacuum Setting	If pressure relief is discharged to vapor control, identify the vapor control
_____	_____	_____	_____
_____	_____	_____	_____

12. Operational Data (complete (a) through (g) of this item for all materials stored or to be stored. Attach additional sheets if necessary.)

a) Material Filtrate from Vacuum Filters Trade Name Filtrate
Density: 8.33 lbs/gal or ---- ° API Producer FERMCO

b) Temperature of stored material: Average AMB °F and Maximum AMB °F
(If temperature is approximately outdoor ambient temperature, write "AMB".)

c) Vapor pressure of stored material (Complete i, ii, iii of this item. If vapor pressure is not known, write "unknown"):

i.) Actual vapor pressure: 0.23 psia at average storage temperature
0.29 psia at maximum storage temperature

ii.) Reid vapor pressure: Average unkn psi and minimum-maximum unkn - --- psi

iii.) If material stored is a gas or liquified gas, provide the pressure at which is stored: N/A psi gage at N/A °F

N/A d) Type of liquid organic material (If the material is an organic liquid other than a gasoline, fuel oil, kerosene, crude oil, lubricant or other petroleum liquid, answer the question below.)

Is it a photochemically reactive material? Yes No

e) Type of waste material (If the material is a waste, answer the question below.)

Is it a hazardous waste? yes No
If yes, identify type (EPA hazardous waste number) _____

f) Indicate the year (or 12-month period) for item (g): 1-1-93 to 12-31-93

g) Annual throughput of material: 8,500,000 gallons.

Completed by Kip Klee Date 08-19-93

Storage Tank Emission Report
Monday, September 27, 1993

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The calculations for uranium emissions are based on known data where possible and where data for parameters is unknown or incomplete, conservative values producing a "worst case" condition for emissions are used.

The conditions used to determine uranium emissions from the tank are as follows:

- (1) Since the filtrate is composed almost entirely of water (>99%), the vapor pressure of the filtrate is essentially equal to that of water.
- (2) Since uranium does not vaporize at storage conditions the only mechanism for uranium loss from the tank is by entrainment in the aerosol or mist generated during liquid storage and transfer.
- (3) Uranium emissions are determined by multiplying the amount of water lost from the tank by entrainment in the aerosol or mist generated during liquid storage and transfer by an emission factor determined from laboratory tests conducted on Lab sample D-37, Lab #2-9846.
- (4) The emission factor has been determined to be 6×10^{-06} gU/l of solution; the maximum concentration of uranium entrained in the vapor from a boiling solution of 9% uranyl nitrate as determined by the laboratory tests.
- (5) Vapor losses from the tank are calculated using the TANKS software program, version 1.1.
- (6) Maximum emissions are five times the calculated annual emissions.

---- Tank Characteristics ----

Identification

Identification No.:	T096	City:	Dayton
State:	Ohio	Company:	DOE-FEMP

Input Parameters

Type of Tank: Vertical Fixed Roof

Tank Dimensions

Shell Height (ft):	14	Diameter (ft):	10
Liquid Height (ft):	14	Volume (gallons):	8226
Turnovers:	1033	Net Throughput (gal/yr):	8500000

Roof Characteristics

Roof Type:	Cone	Roof Height (ft):	0.000
Slope (ft/ft):	0.00000	Dome Radius (ft):	0.00

Paint Characteristics

Shell Color/Shade:	Aluminum/Specular	Shell Condition:	Good
Roof Color/Shade:	Aluminum/Specular	Roof Condition:	Good

Breather Vent Settings

Vacuum Setting(psig):	0.00	Pressure Setting(psig):	0.00
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---- Storage Tank Contents Temperature Data ----

Daily Average Ambient Temperature (Degrees Fahrenheit) =	51.90
Daily Minimum Ambient Temperature (Degrees Fahrenheit) =	42.30
Daily Maximum Ambient Temperature (Degrees Fahrenheit) =	61.50
Daily Ambient Temperature Range =	19.20
Solar Insolation Factor =	1160.00
Alpha (Shell) =	0.39
Alpha (Roof) =	0.39
Liquid Bulk Temperature (Degrees Fahrenheit) =	53.24
Average Liquid Surface Temperature (Degrees Fahrenheit) =	56.22
Daily Maximum Liquid Surface Temperature (Degrees Fahrenheit) =	62.84
Daily Minimum Liquid Surface Temperature (Degrees Fahrenheit) =	49.60
Daily Vapor Temperature Range =	26.49

---- Storage Tank Vapor Pressure Information ----

Speciation Option: None

Chemical Liquid: Water-based Filtrate

Vapor Pressure of total mixture =	0.227238
Minimum Vapor Pressure of total mixture =	0.175816
Maximum Vapor Pressure of total mixture =	0.287205
Vapor Molecular Weight of Mixture =	18.000000
Vapor pressure range =	0.111389

---- Storage Tank Standing Loss Information (AP-42) ----

Roof Outage =	0.00
Vapor Space Outage =	0.00
Vapor Space Volume =	0.00
Vapor Density =	0.0007
Breather Vent Range =	0.000000
Vapor Space Expansion Factor =	0.044914
Vented Vapor Saturation Factor =	1.000000
Total Standing Losses =	0.00

---- Storage Tank Working Loss Information (AP-42) ----

Net Throughput (gal/year) =	8500000
Liquid Volume (cubic feet) =	1100
Turnovers =	1033
Turnover Factor =	0.1957
Working Loss Product Factor =	1.00
Total Working Losses =	162.00

---- Storage Tank Total Losses (AP-42) ----

Total losses = 162.00 lbs water/year

URANIUM EMISSIONS

These calculations are based on conservative estimates, the actual emissions are expected to be less than those indicated.

Annual Emissions: $\frac{162.0 \text{ lb water}}{\text{year}} \times \frac{6 \times 10^{-06} \text{ lb U}}{1000 \text{ lb water}} = 9.72 \text{ E-07 lb U/year}$

Maximum Emissions: $9.72 \text{ E-07 lb U/year} \times 5 = 4.86 \text{ E-06 lb U/year}$

0006

OHIO ENVIRONMENTAL PROTECTION AGENCY
APPLICATION FOR A PERMIT TO OPERATE
AN AIR CONTAMINANT SOURCE

479 2

D.O.E.-Fernald Environmental Management
Facility Name Project

Mr. Stephen M. Beckman
Person to Contact

7400 Willey Road
Facility Address

Post Office Box 398704
Mailing Address

Fernald Hamilton 45030
City County Zip

Cincinnati OH 45239-8705
City State Zip

513/ 738-6502
Telephone Area Number

513/ 738-6502
Telephone

#1431110128-T097
(Application no., if this is a renewal application)

4953
Std. Ind. Class. Code

1. Complete and attach any of the following appendices most appropriate to the air contaminant source. In addition, a compliance time schedule form is to be attached when applicable. Check as appropriate the following:

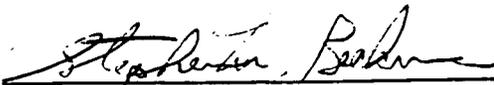
- | | |
|--|---|
| <input type="checkbox"/> Appendix A, Process | <input type="checkbox"/> Appendix L, Solvent Metal Cleaning |
| <input type="checkbox"/> Appendix B, Fuel-Burning Equipment | <input type="checkbox"/> Appendix M, Fugitive Dust Emission Sources |
| <input type="checkbox"/> Appendix C, Incinerator | |
| <input type="checkbox"/> Appendix D, Surface Coating or Printing Operation | |
| <input checked="" type="checkbox"/> Appendix E, Storage Tank | <u>Specify Appendix No.</u> |
| <input type="checkbox"/> Appendix H, Gasoline Dispensing Facility | <input type="checkbox"/> Appendix N, Rubber Tire Manufacturing |
| <input type="checkbox"/> Appendix J, Loading Rack at Bulk Gasoline Plant or Terminal | <input type="checkbox"/> Appendix O, Dry Cleaning Facility |
| <input type="checkbox"/> Appendix K, Surface Coating Line or Printing Line | <input type="checkbox"/> Appendix P, Landfills |
| | <input type="checkbox"/> Other Appendix _____ |
| | <input type="checkbox"/> Compliance Time Schedule |

2. Description of Source (same as used on appendix): Filtrate Receiver Tank

3. Your identification for Source (same as used on appendix):
Filtrate Receiver Tank 735-43-22A - FEMP Id. # 8-025

I, being the individual specified in Rule 3745-35-02(B) of the Ohio Administrative Code, hereby apply for a Permit to Operate the air contaminant source(s) described herein. As required, the following additional documents are submitted as part of this application (describe all attachments):

- (1) Appendix E-2
- (2) Emissions Estimate


Authorized Signature
for Kenneth L. Alkema
Vice President Regulatory Programs
Title
10/4/93
Date

*Pursuant to OAC Rule 3745-35-02(B) (Permit to Operate).

Operation of an air contaminant source without an effective permit to operate is prohibited to 3704.05 Ohio Revised Code. Page 1 EPA-3161

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4792

FOR OFFICIAL USE ONLY

Premise No. ___/___/___/___
Source No. ___/___/___
Application No. ___/___

DOE - FEMP
(Facility Name)

APPENDIX E-2

INORGANIC MATERIAL STORAGE TANK OR
STORAGE TANK WITH CAPACITY LESS THAN 40,000 GALLONS

1. Tank identification: Name or number Filtrate Receiver Tank Date Installed 1955
735-43-22A (T097) (month/year)
2. Tank capacity: 7,050 gallons
3. Tank shape: Cylindrical Rectangular
 Spherical Other, specify _____
4. Tank dimensions: Diameter 10 ft. Height 12 ft. Length ----- Width -----
5. Tank shell material: Steel Aluminum Other, specify _____
6. Type of tank: External floating roof tank
 Internal floating roof tank
 Fixed roof tank
 Vertical cylindrical tank
 Horizontal cylindrical tank
 Pressure tank
 Other, specify _____
7. Location of tank: Outdoors Indoors Underground
8. Type of filling: Splash Submerged Other, specify _____
9. If this tank is located outdoors and above ground, provide the paint color of the tank.
 Aluminum (specular) Light gray White
 Aluminum (diffuse) Medium gray Other, specify Black
Condition of paint: Good Poor
10. If this tank is equipped with or vented to a vapor control system, complete (a) through (c) of this item.
N/A
 - a) Type of vapor control system _____
Manufacturer _____ Make or model _____
Date installed (month and year) _____
 - b) Date tank was equipped with or vented to vapor control system (month & year) _____
 - c) Specify the rate of emission or percent control (by weight) for any pollutants being controlled: _____
(Attach calculations and test data to support response, unless previously submitted)

0008

11. Complete the table below for any pressure or vacuum relief vent valve.
 N/A

Type of Vent Valve	Pressure Setting	Vacuum Setting	If pressure relief is discharged to a vapor control, identify the vapor control.
_____	_____	_____	_____

12. Operational Data (complete (a) through (g) of this item for all materials stored or to be stored. Attach additional sheets if necessary.)

a) Material Filtrate from Vacuum Filters Trade Name Filtrate
 Density: 8.33 lbs/gal or ---- ° API Producer WEMCO

b) Temperature of stored material: Average AMB °F and Maximum AMB °F
 (If temperature is approximately outdoor ambient temperature, write "AMB".)

c) Vapor pressure of stored material (Complete i, ii, iii of this item. If vapor pressure is not known, write "unknown"):

i.) Actual vapor pressure: 0.28 psia at average storage temperature
0.41 psia at maximum storage temperature

ii.) Reid vapor pressure: Average unkn psi and minimum-maximum unkn - --- psi

iii.) If material stored is a gas or liquified gas, provide the pressure at which it is stored: N/A psi gage at N/A °F

N/A d) Type of liquid organic material (If the material is an organic liquid other than a gasoline, fuel oil, kerosene, crude oil, lubricant or other petroleum liquid, answer the question below.)

Is it a photochemically reactive material? [] Yes [] No

e) Type of waste material (If the material is a waste, answer the question below.)

Is it a hazardous waste? [] yes [X] No
 If yes, identify type (EPA hazardous waste number) _____

f) Indicate the year (or 12-month period) for item (g): 1-1-93 to 12-31-93

g) Annual throughput of material: 7,300,000 gallons.

Completed by Kip Klee Date 08-19-93

Storage Tank Emission Report
Monday, September 27, 1993

The calculations for uranium emissions are based on known data where possible and where data for parameters is unknown or incomplete, conservative values producing a "worst case" condition for emissions are used.

The conditions used to determine uranium emissions from the tank are as follows:

- (1) Since the filtrate is composed almost entirely of water (>99%), the vapor pressure of the filtrate is essentially equal to that of water.
- (2) Since uranium does not vaporize at storage conditions the only mechanism for uranium loss from the tank is by entrainment in the aerosol or mist generated during liquid storage and transfer.
- (3) Uranium emissions are determined by multiplying the amount of water lost from the tank by entrainment in the aerosol or mist generated during liquid storage and transfer by an emission factor determined from laboratory tests conducted on Lab sample D-37, Lab #2-9846.
- (4) The emission factor has been determined to be 6×10^{-06} gU/l of solution; the maximum concentration of uranium entrained in the vapor from a boiling solution of 9% uranyl nitrate as determined by the laboratory tests.
- (5) Vapor losses from the tank are calculated using the TANKS software program, version 1.1.
- (6) Maximum emissions are five times the calculated annual emissions.

---- Tank Characteristics ----

Identification

Identification No.:	T097	City:	Dayton
State:	Ohio	Company:	DOE-FERMCO

Input Parameters

Type of Tank: Vertical Fixed Roof

Tank Dimensions

Shell Height (ft):	12	Diameter (ft):	10
Liquid Height (ft):	12	Volume (gallons):	7051
Turnovers:	1035	Net Throughput (gal/yr):	7300000

Roof Characteristics

Roof Type:	Cone	Roof Height (ft):	0.000
Slope (ft/ft):	0.00000	Dome Radius (ft):	0.00

Paint Characteristics

Shell Color/Shade:	Red/Primer	Shell Condition:	Good
Roof Color/Shade:	Red/Primer	Roof Condition:	Good

Breather Vent Settings

Vacuum Setting(psig):	0.00	Pressure Setting(psig):	0.00
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---- Storage Tank Contents Temperature Data ----

Daily Average Ambient Temperature (Degrees Fahrenheit) =	51.90
Daily Minimum Ambient Temperature (Degrees Fahrenheit) =	42.30
Daily Maximum Ambient Temperature (Degrees Fahrenheit) =	61.50
Daily Ambient Temperature Range =	19.20
Solar Insolation Factor =	1160.00
Alpha (Shell) =	0.89
Alpha (Roof) =	0.89
Liquid Bulk Temperature (Degrees Fahrenheit) =	56.24
Average Liquid Surface Temperature (Degrees Fahrenheit) =	62.49
Daily Maximum Liquid Surface Temperature (Degrees Fahrenheit) =	73.17
Daily Minimum Liquid Surface Temperature (Degrees Fahrenheit) =	51.81
Daily Vapor Temperature Range =	42.73

---- Storage Tank Vapor Pressure Information ----
 Speciation Option: None
 Chemical Liquid: Water-based Filtrate

Vapor Pressure of total mixture =	0.283469
Minimum Vapor Pressure of total mixture =	0.192377
Maximum Vapor Pressure of total mixture =	0.409037
Vapor Molecular Weight of Mixture =	18.000000
Vapor pressure range =	0.216660

---- Storage Tank Standing Loss Information (AP-42) ----

Roof Outage =	0.00
Vapor Space Outage =	0.00
Vapor Space Volume =	0.00
Vapor Density =	0.0009
Breather Vent Range =	0.000000
Vapor Space Expansion Factor =	0.051799
Vented Vapor Saturation Factor =	1.000000
Total Standing Losses =	0.00

---- Storage Tank Working Loss Information (AP-42) ----

Net Throughput (gal/year) =	7300000
Liquid Volume (cubic feet) =	942
Turnovers =	1035
Turnover Factor =	0.1956
Working Loss Product Factor =	1.00
Total Working Losses =	173.51

---- Storage Tank Total Losses (AP-42) ----
 Total losses = 173.51 lbs water/year

URANIUM EMISSIONS

These calculations are based on conservative estimates, the actual emissions are expected to be less than those indicated.

Annual Emissions: $\frac{173.51 \text{ lb water}}{\text{year}} \times \frac{6 \times 10^{-06} \text{ lb U}}{1000 \text{ lb water}} = 1.04 \text{ E-06 lb U/year}$

Maximum Emissions: $1.04 \text{ E-06 lb U/year} \times 5 = 5.21 \text{ E-06 lb U/year}$

E-4792

OHIO ENVIRONMENTAL PROTECTION AGENCY
APPLICATION FOR A PERMIT TO OPERATE
AN AIR CONTAMINANT SOURCE

D.O.E.-Fernald Environmental Management
Facility Name Project

Mr. Stephen M. Beckman
Person to Contact

7400 Willey Road
Facility Address

Post Office Box 398704
Mailing Address

Fernald Hamilton 45030
City County Zip

Cincinnati OH 45239-8705
City State Zip

513/ 738-6502
Telephone Area Number

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#1431110128-T098
(Application no., if this is a renewal application)

4953
Std. Ind. Class. Code

1. Complete and attach any of the following appendices most appropriate to the air contaminant source. In addition, a compliance time schedule form is to be attached when applicable. Check as appropriate the following:

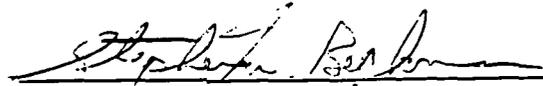
- | | |
|--|---|
| <input type="checkbox"/> Appendix A, Process | <input type="checkbox"/> Appendix L, Solvent Metal Cleaning |
| <input type="checkbox"/> Appendix B, Fuel-Burning Equipment | <input type="checkbox"/> Appendix M, Fugitive Dust Emission Sources |
| <input type="checkbox"/> Appendix C, Incinerator | |
| <input type="checkbox"/> Appendix D, Surface Coating or Printing Operation | |
| <input checked="" type="checkbox"/> Appendix E, Storage Tank | <u>Specify Appendix No.</u> |
| <input type="checkbox"/> Appendix H, Gasoline Dispensing Facility | <input type="checkbox"/> Appendix N, Rubber Tire Manufacturing |
| <input type="checkbox"/> Appendix J, Loading Rack at Bulk Gasoline Plant or Terminal | <input type="checkbox"/> Appendix O, Dry Cleaning Facility |
| <input type="checkbox"/> Appendix K, Surface Coating Line or Printing Line | <input type="checkbox"/> Appendix P, Landfills |
| | <input type="checkbox"/> Other Appendix _____ |
| | <input type="checkbox"/> Compliance Time Schedule |

2. Description of Source (same as used on appendix): Filtrate Receiver Tank

3. Your identification for Source (same as used on appendix):
Filtrate Receiver Tank 735-43-25A - FEMP Id. # 8-026

I, being the individual specified in Rule 3745-35-02(B) of the Ohio Administrative Code, hereby apply for a Permit to Operate the air contaminant source(s) described herein. As required, the following additional documents are submitted as part of this application (describe all attachments):

- (1) Appendix E-2
- (2) Emissions Estimate


 Authorized Signature
 Kenneth L. Alkema
 Vice President Regulatory Programs
 Title

10/4/93
Date

Pursuant to OAC Rule 3745-35-02(B) (Permit to Operate).

Remise No. ___/___/___/___
Source No. ___/___/___/___
Application No. ___/___/___/___

DOE - FEMP
(Facility Name)

APPENDIX E-2

INORGANIC MATERIAL STORAGE TANK OR
STORAGE TANK WITH CAPACITY LESS THAN 40,000 GALLONS

Tank identification: Name or number Filtrate Receiver Tank Date Installed 1955
735-43-25A (T098) (month/year)

Tank capacity: 21,060 gallons

Tank shape: Cylindrical Rectangular
 Spherical Other, specify _____

Tank dimensions: Diameter 16 ft. Height 14 ft. Length ----- Width -----

Tank shell material: Steel Aluminum Other, specify _____

Type of tank: External floating roof tank
 Internal floating roof tank
 Fixed roof tank
 Vertical cylindrical tank
 Horizontal cylindrical tank
 Pressure tank
 Other, specify Rubber-lined tank

Location of tank: Outdoors Indoors Underground

Type of filling: Splash Submerged Other, specify _____

If this tank is located outdoors and above ground, provide the paint color of the tank.

Aluminum (specular) Light gray White
 Aluminum (diffuse) Medium gray Other, specify _____

Condition of paint: Good Poor

If this tank is equipped with or vented to a vapor control system, complete (a) through (c) of this item.

a) Type of vapor control system _____
Manufacturer _____ Make or model _____
Date installed (month and year) _____

b) Date tank was equipped with or vented to vapor control system (month & year) _____

c) Specify the rate of emission or percent control (by weight) for any pollutants being controlled: _____
(Attach calculations and test data to support response, unless previously submitted.)

4792

DOE - FEMP
(Facility Name)
735-43-25A (8-026)
(tank identification)

11. Complete the table below for any pressure or vacuum relief vent valve.
N/A

Type of Vent Valve	Pressure Setting	Vacuum Setting	If pressure relief is discharged to vapor control, identify the vapor control
_____	_____	_____	_____
_____	_____	_____	_____

12. Operational Data (complete (a) through (g) of this item for all materials stored or to be stored. Attach additional sheets if necessary.)

a) Material Filtrate from Vacuum Filters Trade Name Filtrate
Density: 8.33 lbs/gal or ---- ° API Producer WEMCO

b) Temperature of stored material: Average AMB °F and Maximum AMB °F
(If temperature is approximately outdoor ambient temperature, write "AMB".)

c) Vapor pressure of stored material (Complete i, ii, iii of this item. If vapor pressure is not known, write "unknown"):

i.) Actual vapor pressure: 0.21 psia at average storage temperature
0.24 psia at maximum storage temperature

ii.) Reid vapor pressure: Average unkn psi and minimum-maximum unkn ---

iii.) If material stored is a gas or liquified gas, provide the pressure at which it is stored: N/A psi gage at N/A °F

N/A d) Type of liquid organic material (If the material is an organic liquid other than a gasoline, fuel oil, kerosene, crude oil, lubricant or other petroleum liquid, answer the question below.)

Is it a photochemically reactive material? [] Yes [] No

e) Type of waste material (If the material is a waste, answer the question below.)

Is it a hazardous waste? [] yes [X] No

If yes, identify type (EPA hazardous waste number) _____

f) Indicate the year (or 12-month period) for item (g): 1-1-93 to 12-31-93

g) Annual throughput of material: 11,000,000 gallons.

Completed by Kip Klee Date 08-19-93

0014

Storage Tank Emission Report
Monday, September 27, 1993

4792

The calculations for uranium emissions are based on known data where possible and where data for parameters is unknown or incomplete, conservative values producing a "worst case" condition for emissions are used.

The conditions used to determine uranium emissions from the tank are as follows:

- (1) Since the filtrate is composed almost entirely of water (>99%), the vapor pressure of the filtrate is essentially equal to that of water.
- (2) Since uranium does not vaporize at storage conditions the only mechanism for uranium loss from the tank is by entrainment in the aerosol or mist generated during liquid storage and transfer.
- (3) Uranium emissions are determined by multiplying the amount of water lost from the tank by entrainment in the aerosol or mist generated during liquid storage and transfer by an emission factor determined from laboratory tests conducted on Lab sample D-37, Lab #2-9846.
- (4) The emission factor has been determined to be 6×10^{-06} gU/l of solution; the maximum concentration of uranium entrained in the vapor from a boiling solution of 9% uranyl nitrate as determined by the laboratory tests.
- (5) Vapor losses from the tank are calculated using the TANKS software program, version 1.1.
- (6) Maximum emissions are five times the calculated annual emissions.

---- Tank Characteristics ----

Identification

Identification No.:	T098	City:	Dayton
State:	Ohio	Company:	DOE-FERMCO

Input Parameters

Type of Tank: Vertical Fixed Roof

Tank Dimensions

Shell Height (ft):	14	Diameter (ft):	16
Liquid Height (ft):	14	Volume (gallons):	21059
Turnovers:	498	Net Throughput (gal/yr):	11000000

Roof Characteristics

Roof Type:	Cone	Roof Height (ft):	0.000
Slope (ft/ft):	0.00000	Dome Radius (ft):	0.00

Paint Characteristics

Shell Color/Shade:	White/White	Shell Condition:	Good
Roof Color/Shade:	White/White	Roof Condition:	Good

Breather Vent Settings

Vacuum Setting(psig):	0.00	Pressure Setting(psig):	0.00
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0015

4792

---- Storage Tank Contents Temperature Data ----

Daily Average Ambient Temperature (Degrees Fahrenheit) =	51.90
Daily Minimum Ambient Temperature (Degrees Fahrenheit) =	42.30
Daily Maximum Ambient Temperature (Degrees Fahrenheit) =	61.50
Daily Ambient Temperature Range =	19.20
Solar Insolation Factor =	1160.00
Alpha (Shell) =	0.17
Alpha (Roof) =	0.17
Liquid Bulk Temperature (Degrees Fahrenheit) =	51.92
Average Liquid Surface Temperature (Degrees Fahrenheit) =	53.47
Daily Maximum Liquid Surface Temperature (Degrees Fahrenheit) =	58.31
Daily Minimum Liquid Surface Temperature (Degrees Fahrenheit) =	48.63
Daily Vapor Temperature Range =	19.35

---- Storage Tank Vapor Pressure Information ----

Speciation Option: None

Chemical Liquid: Water-based Filtrate

Vapor Pressure of total mixture =	0.205513
Minimum Vapor Pressure of total mixture =	0.170353
Maximum Vapor Pressure of total mixture =	0.243721
Vapor Molecular Weight of Mixture =	18.000000
Vapor pressure range =	0.073368

---- Storage Tank Standing Loss Information (AP-42) ----

Roof Outage =	0.00
Vapor Space Outage =	0.00
Vapor Space Volume =	0.00
Vapor Density =	0.0007
Breather Vent Range =	0.000000
Vapor Space Expansion Factor =	0.042478
Vented Vapor Saturation Factor =	1.000000
Total Standing Losses =	0.00

---- Storage Tank Working Loss Information (AP-42) ----

Net Throughput (gal/year) =	11000000
Liquid Volume (cubic feet) =	2815
Turnovers =	522
Turnover Factor =	0.2241
Working Loss Product Factor =	1.00
Total Working Losses =	217.12

---- Storage Tank Total Losses (AP-42) ----

Total losses = 217.12 lbs water/year

URANIUM EMISSIONS

These calculations are based on conservative estimates, the actual emissions are expected to be less than those indicated.

Annual Emissions: $\frac{217.12 \text{ lb water}}{\text{year}} \mid \frac{6 \times 10^{-06} \text{ lb U}}{1000 \text{ lb water}} \mid = 1.30 \text{ E-06 lb U/year}$

Maximum Emissions: $1.30 \text{ E-06 lb U/year} \times 5 = 6.51 \text{ E-06 lb U/year}$

0016

OHIO ENVIRONMENTAL PROTECTION AGENCY
APPLICATION FOR A PERMIT TO OPERATE
AN AIR CONTAMINANT SOURCE

D.O.E.-Fernald Environmental Management
Facility Name Project

Mr. Stephen M. Beckman
Person to Contact

4792

7400 Willey Road
Facility Address

Post Office Box 398704
Mailing Address

Fernald Hamilton 45030
City County Zip

Cincinnati OH 45239-8705
City State Zip

513/ 738-6502
Telephone Area Number

513/ 738-6502
Telephone

#1431110128-T099
(Application no., if this is a renewal application)

4953
Std. Ind. Class. Code

1. Complete and attach any of the following appendices most appropriate to the air contaminant source. In addition, a compliance time schedule form is to be attached when applicable. Check as appropriate the following:

- Appendix A, Process
- Appendix B, Fuel-Burning Equipment
- Appendix C, Incinerator
- Appendix D, Surface Coating or Printing Operation
- Appendix E, Storage Tank
- Appendix H, Gasoline Dispensing Facility
- Appendix J, Loading Rack at Bulk Gasoline Plant or Terminal
- Appendix K, Surface Coating Line or Printing Line

- Appendix L, Solvent Metal Cleaning
- Appendix M, Fugitive Dust Emission Sources

- Specify Appendix No.
- Appendix N, Rubber Tire Manufacturing
 - Appendix O, Dry Cleaning Facility
 - Appendix P, Landfills
 - Other Appendix _____
 - Compliance Time Schedule

2. Description of Source (same as used on appendix): Filtrate Receiver Tank

3. Your identification for Source (same as used on appendix):
Filtrate Receiver Tank 735-43-28A - FEMP Id. # 8-027

I, being the individual specified in Rule 3745-35-02(B) of the Ohio Administrative Code, hereby apply for a Permit to Operate the air contaminant source(s) described herein. As required, the following additional documents are submitted as part of this application (describe all attachments):

- (1) Appendix E-2
- (2) Emissions Estimate

Stephen M. Beckman
Authorized Signature
for Kenneth L. Alkema
Vice President Regulatory Programs
Title
10/4/93
Date

*Pursuant to OAC Rule 3745-35-02(B) (Permit to Operate).

Operation of an air contaminant source without an effective permit to operate is prohibited to 3704.05 Ohio Revised Code. Page 1 EPA-3161

0017

FOR OFFICIAL USE ONLY

Premise No. ___/___/___/___
Source No. ___/___
Application No. ___/___

DOE - FEMP
(Facility Name)

APPENDIX E-2

INORGANIC MATERIAL STORAGE TANK OR
STORAGE TANK WITH CAPACITY LESS THAN 40,000 GALLONS

1. Tank identification: Name or number Filtrate Receiver Tank Date Installed 1955
735-43-28A (T099) (month/year)
2. Tank capacity: 7,050 gallons
3. Tank shape: Cylindrical Rectangular
 Spherical Other, specify _____
4. Tank dimensions: Diameter 10 ft. Height 12 ft. Length ----- Width -----
5. Tank shell material: Steel Aluminum Other, specify _____
6. Type of tank: External floating roof tank
 Internal floating roof tank
 Fixed roof tank
 Vertical cylindrical tank
 Horizontal cylindrical tank
 Pressure tank
 Other, specify _____
7. Location of tank: Outdoors Indoors Underground
8. Type of filling: Splash Submerged Other, specify _____
9. If this tank is located outdoors and above ground, provide the paint color of the tank.
 Aluminum (specular) Light gray White
 Aluminum (diffuse) Medium gray Other, specify Black
Condition of paint: Good Poor
10. If this tank is equipped with or vented to a vapor control system, complete (a) through (c) of this item.
N/A
 - a) Type of vapor control system _____
Manufacturer _____ Make or model _____
Date installed (month and year) _____
 - b) Date tank was equipped with or vented to vapor control system (month & year) _____
 - c) Specify the rate of emission or percent control (by weight) for any pollutants being controlled: _____
(Attach calculations and test data to support response, unless previously submitted.)

1. Complete the table below for any pressure or vacuum relief vent valve.
N/A

Type of Vent Valve	Pressure Setting	Vacuum Setting	If pressure relief is discharged to a vapor control, identify the vapor control.
_____	_____	_____	_____

2. Operational Data (complete (a) through (g) of this item for all materials stored or to be stored. Attach additional sheets if necessary.)

a) Material Filtrate from Vacuum Filters Trade Name Filtrate
Density: 8.33 lbs/gal or ---- ° API Producer WEMCO

b) Temperature of stored material: Average AMB °F and Maximum AMB °F
(If temperature is approximately outdoor ambient temperature, write "AMB".)

c) Vapor pressure of stored material (Complete i, ii, iii of this item. If vapor pressure is not known, write "unknown"):

i.) Actual vapor pressure: 0.28 psia at average storage temperature
0.41 psia at maximum storage temperature

ii.) Reid vapor pressure: Average unkn psi and minimum-maximum unkn - --- psi

iii.) If material stored is a gas or liquified gas, provide the pressure at which it is stored: N/A psi gage at N/A °F

N/A d) Type of liquid organic material (If the material is an organic liquid other than a gasoline, fuel oil, kerosene, crude oil, lubricant or other petroleum liquid, answer the question below.)

Is it a photochemically reactive material? [] Yes [] No

e) Type of waste material (If the material is a waste, answer the question below.)

Is it a hazardous waste? [] yes [X] No
If yes, identify type (EPA hazardous waste number) _____

f) Indicate the year (or 12-month period) for item (g): 1-1-93 to 12-31-93

g) Annual throughput of material: 7,300,000 gallons.

Completed by Kip Klee Date 08-19-93

Storage Tank Emission Report
Monday, September 27, 1993

The calculations for uranium emissions are based on known data where possible and where data for parameters is unknown or incomplete, conservative values producing a "worst case" condition for emissions are used.

The conditions used to determine uranium emissions from the tank are as follows:

- (1) Since the filtrate is composed almost entirely of water (>99%), the vapor pressure of the filtrate is essentially equal to that of water.
- (2) Since uranium does not vaporize at storage conditions the only mechanism for uranium loss from the tank is by entrainment in the aerosol or mist generated during liquid storage and transfer.
- (3) Uranium emissions are determined by multiplying the amount of water lost from the tank by entrainment in the aerosol or mist generated during liquid storage and transfer by an emission factor determined from laboratory tests conducted on Lab sample D-37, Lab #2-9846.
- (4) The emission factor has been determined to be 6×10^{-06} gU/l of solution; the maximum concentration of uranium entrained in the vapor from a boiling solution of 9% uranyl nitrate as determined by the laboratory tests.
- (5) Vapor losses from the tank are calculated using the TANKS software program, version 1.1.
- (6) Maximum emissions are five times the calculated annual emissions.

---- Tank Characteristics ----

Identification

Identification No.:	T099	City:	Dayton
State:	Ohio	Company:	DOE-FERMCO

Input Parameters

Type of Tank: Vertical Fixed Roof

Tank Dimensions

Shell Height (ft):	12	Diameter (ft):	10
Liquid Height (ft):	12	Volume (gallons):	7051
Turnovers:	1035	Net Throughput (gal/yr):	7300000

Roof Characteristics

Roof Type:	Cone	Roof Height (ft):	0.000
Slope (ft/ft):	0.00000	Dome Radius (ft):	0.00

Paint Characteristics

Shell Color/Shade:	Red/Primer	Shell Condition:	Good
Roof Color/Shade:	Red/Primer	Roof Condition:	Good

Breather Vent Settings

Vacuum Setting(psig):	0.00	Pressure Setting(psig):	0.00
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---- Storage Tank Contents Temperature Data ----

Daily Average Ambient Temperature (Degrees Fahrenheit) =	51.90
Daily Minimum Ambient Temperature (Degrees Fahrenheit) =	42.30
Daily Maximum Ambient Temperature (Degrees Fahrenheit) =	61.50
Daily Ambient Temperature Range =	19.20
Solar Insolation Factor =	1160.00
Alpha (Shell) =	0.89
Alpha (Roof) =	0.89
Liquid Bulk Temperature (Degrees Fahrenheit) =	56.24
Average Liquid Surface Temperature (Degrees Fahrenheit) =	62.49
Daily Maximum Liquid Surface Temperature (Degrees Fahrenheit) =	73.17
Daily Minimum Liquid Surface Temperature (Degrees Fahrenheit) =	51.81
Daily Vapor Temperature Range =	42.73

---- Storage Tank Vapor Pressure Information ----
 Speciation Option: None
 Chemical Liquid: Water-based Filtrate

Vapor Pressure of total mixture =	0.283469
Minimum Vapor Pressure of total mixture =	0.192377
Maximum Vapor Pressure of total mixture =	0.409037
Vapor Molecular Weight of Mixture =	18.000000
Vapor pressure range =	0.216660

---- Storage Tank Standing Loss Information (AP-42) ----

Roof Outage =	0.00
Vapor Space Outage =	0.00
Vapor Space Volume =	0.00
Vapor Density =	0.0009
Breather Vent Range =	0.000000
Vapor Space Expansion Factor =	0.051799
Vented Vapor Saturation Factor =	1.000000
Total Standing Losses =	0.00

---- Storage Tank Working Loss Information (AP-42) ----

Net Throughput (gal/year) =	7300000
Liquid Volume (cubic feet) =	942
Turnovers =	1035
Turnover Factor =	0.1956
Working Loss Product Factor =	1.00
Total Working Losses =	173.51

---- Storage Tank Total Losses (AP-42) ----
 Total losses = 173.51 lbs water/year

URANIUM EMISSIONS

These calculations are based on conservative estimates, the actual emissions are expected to be less than those indicated.

Annual Emissions: $\frac{173.51 \text{ lb water}}{\text{year}} \times \frac{6 \times 10^{-06} \text{ lb U}}{1000 \text{ lb water}} = 1.04 \text{ E-06 lb U/year}$

Maximum Emissions: $1.04 \text{ E-06 lb U/year} \times 5 = 5.21 \text{ E-06 lb U/year}$

OHIO ENVIRONMENTAL PROTECTION AGENCY
 APPLICATION FOR A PERMIT TO OPERATE
 AN AIR CONTAMINANT SOURCE

4792

D.O.E.-Fernald Environmental Management
 Facility Name Project

Mr. Stephen M. Beckman
 Person to Contact

7400 Willey Road
 Facility Address

Post Office Box 398704
 Mailing Address

Fernald Hamilton 45030
 City County Zip

Cincinnati OH 45239-8705
 City State Zip

513/ 738-6502
 Telephone Area Number

513/ 738-6502
 Telephone

#1431110128-T100
 (Application no., if this is a renewal application)

4953
 Std. Ind. Class. Code

1. Complete and attach any of the following appendices most appropriate to the air contaminant source. In addition, a compliance time schedule form is to be attached when applicable. Check as appropriate the following:

- | | |
|--|---|
| <input type="checkbox"/> Appendix A, Process | <input type="checkbox"/> Appendix L, Solvent Metal Cleaning |
| <input type="checkbox"/> Appendix B, Fuel-Burning Equipment | <input type="checkbox"/> Appendix M, Fugitive Dust Emission Sources |
| <input type="checkbox"/> Appendix C, Incinerator | |
| <input type="checkbox"/> Appendix D, Surface Coating or Printing Operation | |
| <input checked="" type="checkbox"/> Appendix E, Storage Tank | Specify Appendix No. |
| <input type="checkbox"/> Appendix F, Gasoline Dispensing Facility | <input type="checkbox"/> Appendix N, Rubber Tire Manufacturing |
| <input type="checkbox"/> Appendix J, Loading Rack at Bulk Gasoline Plant or Terminal | <input type="checkbox"/> Appendix O, Dry Cleaning Facility |
| <input type="checkbox"/> Appendix K, Surface Coating Line or Printing Line | <input type="checkbox"/> Appendix P, Landfills |
| | <input type="checkbox"/> Other Appendix _____ |
| | <input type="checkbox"/> Compliance Time Schedule |

2. Description of Source (same as used on appendix): Accountability Tank
3. Your identification for Source (same as used on appendix):
Plant 8 - Accountability Tank, FEMP Id. # 8-028

I, being the individual specified in Rule 3745-35-02(B) of the Ohio Administrative Code, hereby apply for a Permit to Operate the air contaminant source(s) described herein. As required, the following additional documents are submitted as part of this application (describe all attachments):

- (1) Appendix E-2
 (2) Emissions Estimate

Stephen M. Beckman
 Authorized Signature
 Kenneth L. Alkema
 Vice President Regulatory Programs
 Title

10/4/93
 Date

*Pursuant to OAC Rule 3745-35-02(B) (Permit to Operate).

Operation of an air contaminant source without an effective permit to operate is prohibited to 3704.05 Ohio Revised Code. Page 1 EPA-3161

0022

479

DOE - FEMP
(Facility Name)
8-028 Accountability T
(tank identification)

11. Complete the table below for any pressure or vacuum relief vent valve.
N/A

Type of Vent Valve	Pressure Setting	Vacuum Setting	If pressure relief is discharged to vapor control, identify the vapor control
_____	_____	_____	_____

12. Operational Data (complete (a) through (g) of this item for all materials stored or to be stored. Attach additional sheets if necessary.)

a) Material Sump liquor (essentially water) Trade Name Sump liquor
Density: 8.4 lbs/gal or ---- ° API Producer FERMCO

b) Temperature of stored material: Average AMB °F and Maximum AMB °F
(If temperature is approximately outdoor ambient temperature, write "AMB".)

c) Vapor pressure of stored material (Complete i, ii, iii of this item. If vapor pressure is not known, write "unknown"):

i.) Actual vapor pressure: 0.4642 psia at average storage temperature
0.4642 psia at maximum storage temperature

ii.) Reid vapor pressure: Average unkn psi and minimum-maximum unkn - --- psi

iii.) If material stored is a gas or liquified gas, provide the pressure at which is stored: N/A psi gage at N/A °F

N/A d) Type of liquid organic material (If the material is an organic liquid other than a gasoline, fuel oil, kerosene, crude oil, lubricant or other petroleum liquid, answer the question below.)

Is it a photochemically reactive material? [] Yes [] No

e) Type of waste material (If the material is a waste, answer the question below.)

Is it a hazardous waste? [] yes [X] No
If yes, identify type (EPA hazardous waste number) _____

f) Indicate the year (or 12-month period) for item (g): 1-1-93 to 12-31-93

g) Annual throughput of material: 1,250,000 gallons.

Completed by Kip Klee Date 08-25-93

0024

Storage Tank Emission Report
Monday, September 27, 1993

The calculations for uranium emissions are based on known data where possible and where data for parameters is unknown or incomplete, conservative values producing a "worst case" condition for emissions are used.

The conditions used to determine uranium emissions from the tank are as follows:

- (1) Since the sump liquor is composed almost entirely of water (>99%), the vapor pressure of the liquor is essentially equal to that of water.
- (2) Since uranium does not vaporize at storage conditions the only mechanism for uranium loss from the tank is by entrainment in the aerosol or mist generated during liquid storage and transfer.
- (3) Uranium emissions are determined by multiplying the amount of water lost from the tank by entrainment in the aerosol or mist generated during liquid storage and transfer by an emission factor determined from laboratory tests conducted on Lab sample D-37, Lab #2-9846.
- (4) The emission factor has been determined to be 6×10^{-06} gU/l of solution; the maximum concentration of uranium entrained in the vapor from a boiling solution of 9% uranyl nitrate as determined by the laboratory tests.
- (5) Vapor losses from the tank are calculated using the TANKS software program, version 1.1.
- (6) Maximum emissions are five times the calculated annual emissions.

---- Tank Characteristics ----

Identification

Identification No.:	T100	City:	Dayton
State:	Ohio	Company:	DOE-FERMCO

Input Parameters

Type of Tank: Vertical Fixed Roof

Tank Dimensions

Shell Height (ft):	10	Diameter (ft):	8
Liquid Height (ft):	10	Volume (gallons):	3761
Turnovers:	340	Net Throughput (gal/yr):	1250000

Roof Characteristics

Roof Type:	Cone	Roof Height (ft):	0.000
Slope (ft/ft):	0.00000	Dome Radius (ft):	0.00

Paint Characteristics

Shell Color/Shade:	White/White	Shell Condition:	Good
Roof Color/Shade:	White/White	Roof Condition:	Good

Breather Vent Settings

Vacuum Setting(psig):	0.00	Pressure Setting(psig):	0.00
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0025

---- Storage Tank Contents Temperature Data ----

Daily Average Ambient Temperature (Degrees Fahrenheit) =	51.90
Daily Minimum Ambient Temperature (Degrees Fahrenheit) =	42.30
Daily Maximum Ambient Temperature (Degrees Fahrenheit) =	61.50
Daily Ambient Temperature Range =	19.20
Solar Insolation Factor =	1160.00
Alpha (Shell) =	0.17
Alpha (Roof) =	0.17
Liquid Bulk Temperature (Degrees Fahrenheit) =	51.92
Average Liquid Surface Temperature (Degrees Fahrenheit) =	53.47
Daily Maximum Liquid Surface Temperature (Degrees Fahrenheit) =	58.31
Daily Minimum Liquid Surface Temperature (Degrees Fahrenheit) =	48.63
Daily Vapor Temperature Range =	19.35

---- Storage Tank Vapor Pressure Information ----

Speciation Option: None

Chemical Liquid: Water-based Filtrate

Vapor Pressure of total mixture =	0.205513
Minimum Vapor Pressure of total mixture =	0.170353
Maximum Vapor Pressure of total mixture =	0.243721
Vapor Molecular Weight of Mixture =	18.000000
Vapor pressure range =	0.073368

---- Storage Tank Standing Loss Information (AP-42) ----

Roof Outage =	0.00
Vapor Space Outage =	0.00
Vapor Space Volume =	0.00
Vapor Density =	0.0007
Breather Vent Range =	0.000000
Vapor Space Expansion Factor =	0.042478
Vented Vapor Saturation Factor =	1.000000
Total Standing Losses =	0.00

---- Storage Tank Working Loss Information (AP-42) ----

Net Throughput (gal/year) =	1250000
Liquid Volume (cubic feet) =	503
Turnovers =	332
Turnover Factor =	0.2569
Working Loss Product Factor =	1.00
Total Working Losses =	28.29

---- Storage Tank Total Losses (AP-42) ----

Total losses = 28.29 lbs water/year

URANIUM EMISSIONS

These calculations are based on conservative estimates, the actual emissions are expected to be less than those indicated.

Annual Emissions: $\frac{28.29 \text{ lb water}}{\text{year}} \times \frac{6 \times 10^{-6} \text{ lb U}}{1000 \text{ lb water}} = 1.70 \text{ E-07 lb U/year}$

Maximum Emissions: $1.70 \text{ E-07 lb U/year} \times 5 = 8.49 \text{ E-07 lb U/year}$