



APC-2020/0176-Con

TECHNICAL SERVICES, LLC
600 BRANDYWINE AVENUE • BLDG 100 • DOWNINGTOWN • PA • 19335 • 610-269-1010 • FAX 610-269-6355

May 22, 2020

Via UPS Ground

Ms. Angela Marconi
Program Manager, Engineering & Compliance Branch Delaware
Department of Natural Resources & Environmental Control
Division of Air Quality State Street Commons
100 W. Water Street
Dover, DE 19904

RE: Air Permit Application for Portable Non-Metallic Mineral Processing Plant for Terra Technical Services, LLC
Located at 321 Hillside Road, Newark, DE 19717

Dear Ms. Marconi,

Terra Technical Services, LLC ("Terra Tech") is submitting an air permit application for its portable non-metallic mineral processing plant to be located at 321 Hillside Road, Newark, Delaware. The non-metallic mineral processing plant will consist of a Sandvik QI341 Impact Crusher and Edge TS 80 Tracked Stacker along with their associated diesel engines. The equipment will be used to process demolished concrete to be reused on site. Crushing operations at the site are expected to last approximately one (1) month.

Please find enclosed the appropriate permit applications, a block flow diagram, emission calculations, and specific equipment specifications information in support of the application.

If you have any additional questions or concerns, please do not hesitate to contact by email at rhaly@goterra.com or by phone at 610.269.1010, or you can contact our consultant, Suzanne Arntz of Compliance Plus Services, Inc. at sarntz@complianceplusservices.com or via phone at 215734-1414.

Sincerely,

Robert Haly Terra Technical Services, LLC

Cc: S. Arntz, Compliance Plus Service – electronic.

Form AQM-1

Administrative Information



DNREC – Division of Air Quality
Application to Construct, Operate, or Modify
Stationary Sources

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Administrative Information

One original and one copy of All Application Forms Should Be Mailed To:
Division of Air Quality
100 West Water Street, Suite 6A
Dover, DE 19904

All Checks Should Be Made Payable To:
State of Delaware

<u>Company and Site Information</u>	
1.	Company Name: Terra Technical Services, LLC
2.	Company Mailing Address: 600 Brandywine Ave City: Downingtown State: PA Zip Code: 19335
3.	Site Name: University of Delaware Crushing/Screening Plant
4.	Site Mailing Address: <i>(if different from above)</i> City: State: Zip Code:
5.	Physical Location of Site: 321 Hillside Road <i>(if different from above)</i> City: Newark State: Delaware Zip Code: 19717
6.	Site Billing Address: <i>(if different from above)</i> City: State: Zip Code:
7.	Air Quality Management Facility ID Number:
8.	Site NAICS Code): 212399 <i>(list all that apply)</i>
9.	Site SIC Code: <i>(list all that apply)</i>
10.	Site Location Coordinates: Latitude: 39 ° 40' 48.3" Longitude: 75 ° 45' 42.1"
11.	Is the Facility New or Existing? <input checked="" type="checkbox"/> NEW <input type="checkbox"/> EXISTING
<i>If the Facility is an Existing Facility, Complete the Rest of Question 11. If Not, Proceed to Question 12.</i>	
11.1.	Does the Facility Have Active Air Permits? <input type="checkbox"/> YES <input type="checkbox"/> NO
12.	Is this Application For New Equipment or a Modification to Existing Equipment? <input checked="" type="checkbox"/> New Equipment <input type="checkbox"/> Modification of Existing Equipment <input type="checkbox"/> Other (Specify):
<i>If the application is for the modification of existing equipment, complete the rest of Question 12. If not, proceed to Question 13.</i>	



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Company and Site Information

12.1. Does the Equipment Have an Active Air Permit? ☐ YES ☒ NO

If the equipment has an active air permit, complete the rest of Question 12. If not, proceed to Question 13.

12.2. Permit Number of Existing Equipment:

13. Status of Equipment Being Applied For: ☒ Natural Minor Source
☐ Synthetic Minor Source
☐ Major Source
☐ Federally Enforceable Restrictions

14. Facility Status: ☒ Natural Minor Facility ☐ Synthetic Minor Facility ☐ Major Facility

If the facility is a Major Source, complete the rest of Question 14. If not, proceed to Question 15.

14.1. Responsible Official Name: **Robert Haly**

14.2. Responsible Official Title:

Contact Information

15. Name of Owner or Facility Manager: **Robert Haly**

16. Title of Owner or Facility Manager: **Vice President**

17. Permit Contact Name: **Suzanne Arntz**

18. Permit Contact Title: **Air Permitting Specialist**

19. Permit Contact Telephone Number: **215-734-1414**

20. Permit Contact Fax Number: **215-734-1424**

21. Permit Contact E-Mail Address: **sarntz@complianceplusservices.com**

22. Billing Contact Name: **Robert Haly**

23. Billing Contact Title: **Vice President**

24. Billing Contact Telephone Number: **610-269-1010**

25. Billing Contact Fax Number:

26. Billing Contact E-Mail Address: **rhaly@goterra.com**

Proposed Construction and Operating Schedule

27. When Will the Proposed Construction/Installation/Modification Occur: **6/1/2020**

28. Proposed Operating Schedule: **10 hours/day 4 days/week 4 (160 hours total) weeks/year**

28.1. Is There Any Additional Information Regarding the Operating Schedule? ☐ YES ☒ NO

If YES, complete the rest of Question 28. If NO, proceed to Question 29.



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Proposed Construction and Operating Schedule

28.2. Describe the Additional Information:

Coastal Zone Information

29. Is the Facility Located in the Coastal Zone? ☐ YES ☒ NO

If the facility is located in the Coastal Zone complete the rest of Question 29. If not, proceed to Question 30.

29.1. Is a Coastal Zone Permit Required for Construction or Operation of the Source Being Applied for? ☐ YES ☐ NO

Attach a copy of the Coastal Zone Determination if it has not been previously submitted

If a Coastal Zone Permit is required complete the rest of Question 29. If not, proceed to Question 30.

29.2. Has a Coastal Zone Permit Been Issued? ☐ YES ☐ NO

Attach a copy of the Coastal Zone Permit if it has not been previously submitted

Local Zoning Information

30. Parcel Zoning: **UN - University**

Attach Proof of Local Zoning if it has not been previously submitted

Application Information

31. Is the Appropriate Application Fee Attached? ☒ YES ☐ NO

32. Is the Advertising Fee Attached? ☒ YES ☐ NO

For help determining your application and advertising fees see:

<http://www.dnrec.state.de.us/DNREC2000/Library/Fees/DE%20Permit%20Fees.htm>

Attach the appropriate fees. Note that your Application will not be considered complete if the appropriate fees are not included.

33. Is a Cover Letter Describing the Process Attached? ☒ YES ☐ NO

Attach a brief cover letter describing your Application.

If the Facility is a New Facility complete Question 34. If not, proceed to Question 35.

34. Is a Copy of the Applicant Background Information Questionnaire on Record at the Department? ☒ YES ☐ NO

If NO, complete the rest of Question 34. If YES, process to Question 35.

34.1 Is a Copy of the Applicant Background Information Questionnaire Attached? ☐ YES ☐ NO

For a copy of the Applicant Background Information Questionnaire see

<http://www.dnrec.delaware.gov/services/Documents/Chapter79Form.pdf>

Attach a copy of the Applicant Background Information Questionnaire if applicable.

35. Check Which Application Forms are Attached:



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Application Information

- | | | | | | | |
|---|----------------------------------|---|-----------------------------------|----------------------------------|---|--------------------------------|
| <input checked="" type="checkbox"/> AQM-1 | <input type="checkbox"/> AQM-3.4 | <input checked="" type="checkbox"/> AQM-3.9 | <input type="checkbox"/> AQM-3.14 | <input type="checkbox"/> AQM-4.4 | <input type="checkbox"/> AQM-4.9 | <input type="checkbox"/> AQM-6 |
| <input checked="" type="checkbox"/> AQM-2 | <input type="checkbox"/> AQM-3.5 | <input type="checkbox"/> AQM-3.10 | <input type="checkbox"/> AQM-3.15 | <input type="checkbox"/> AQM-4.5 | <input type="checkbox"/> AQM-4.10 | |
| <input type="checkbox"/> AQM-3.1 | <input type="checkbox"/> AQM-3.6 | <input type="checkbox"/> AQM-3.11 | <input type="checkbox"/> AQM-4.1 | <input type="checkbox"/> AQM-4.6 | <input type="checkbox"/> AQM-4.11 | |
| <input type="checkbox"/> AQM-3.2 | <input type="checkbox"/> AQM-3.7 | <input type="checkbox"/> AQM-3.12 | <input type="checkbox"/> AQM-4.2 | <input type="checkbox"/> AQM-4.7 | <input type="checkbox"/> AQM-4.12 | |
| <input checked="" type="checkbox"/> AQM-3.3 | <input type="checkbox"/> AQM-3.8 | <input type="checkbox"/> AQM-3.13 | <input type="checkbox"/> AQM-4.3 | <input type="checkbox"/> AQM-4.8 | <input checked="" type="checkbox"/> AQM-5 | |

36. Check Which Documents are Attached:

- | | |
|---|---|
| <input type="checkbox"/> Coastal Zone Determination | <input type="checkbox"/> Claim of Confidentiality |
| <input type="checkbox"/> Coastal Zone Permit | <input checked="" type="checkbox"/> Manufacturer Specification(s) |
| <input type="checkbox"/> Proof of Local Zoning | <input type="checkbox"/> Material Safety Data Sheets (MSDSs) |
| <input checked="" type="checkbox"/> Application Fee | <input checked="" type="checkbox"/> Supporting Calculations |
| <input checked="" type="checkbox"/> Advertising Fee | <input checked="" type="checkbox"/> Descriptive Cover Letter |
| <input type="checkbox"/> Applicant Background Information Questionnaire | <input type="checkbox"/> Other (Specify): |

Confidentiality Information

37. Do You Consider Any of the Information Submitted With this Application Confidential? ☐ YES ☒ NO

For help on how to submit a confidentiality claim see

<http://regulations.delaware.gov/register/december2011/final/15%20DE%20Reg%20864%2012-01-11.htm>

If a Claim of Confidentiality is made it MUST meet the requirements of Section 6 of DNREC's Freedom of Information ("FOIA") Regulation at the time the Application is submitted.

Signature Block

I, the undersigned, hereby certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all of its attachments as to the truth, accuracy, and completeness of this information. I certify based on information and belief formed after reasonable inquiry, the statements and information in this document are true, accurate, and complete. By signing this form, I certify that I have not changed, altered, or deleted any portions of this application. I acknowledge that I cannot commence construction, alteration, modification or initiate operation until I receive written approval (i.e. permit, registration, or exemption letter) from the Department. I acknowledge that I may be required to perform testing of the equipment to receive construction or operation approval, and that if I do not receive approval to construct or operate that I may appeal the decision.

TERRA TECHNICAL ROBERT HALY

Owner or Operator

5/20/20
Date

[Signature]
Signature of Owner or Operator

One Original and One Copy of All Application Forms Should Be Mailed To:
Division of Air Quality
100 W. Water Street, Suite 6A
Dover, Delaware 19904

All Checks Should Be Made Payable To:
State of Delaware

Form AQM-2

Process Flow Diagram



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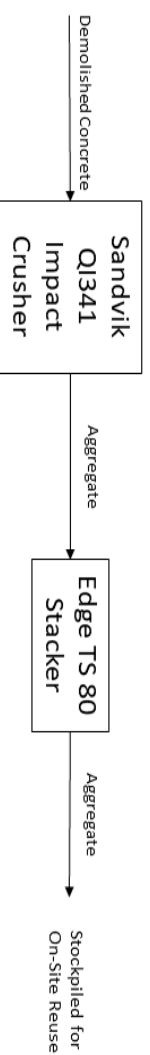
Process Flow Diagram

Sketch the Process Flow Diagram for the equipment or process being applied for. Include each emission unit and control device (even existing emission units that will not be modified by this application). You may identify each emission unit with a simple shape.

Label each emission unit and control device with a unique identifier. Show the relationship between each emission unit and/or control device by drawing arrows between them to indicate the flow of air pollutants. List which application forms are included for each emission unit or control device below the shape representing each emission unit or control device . See

<http://www.delaware.gov/reg2/default.htm> for example Process Flow Diagrams for common processes. If you already have a Process Flow Diagram for the equipment or process being applied for, you may attach it to the application instead of using this form.

Terra Technical Services, LLC Crushing Plant



Form AQM-3.3

Generator/Engine Application



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Application to Construct, Operate, or Modify
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Form AQM-3.3
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Generator/Engine Application

If you are using this form electronically, press F1 at any time for help

<u>General Information</u>	
1.	Facility Name: Terra Technical Services, LLC
2.	Equipment ID: Eng 01
3.	Manufacturer: Caterpillar
4.	Model: C9.3
5.	Serial Number: CS900616
6.	Maximum Power Rating of Engine: 350 horsepower
7.	Standby Power Rating of Generator: 262 kilowatt
8.	Date of Manufacture: 2014
9.	Installation Date:
10.	Is the Equipment Being Applied For a Generator or an Engine? <input type="checkbox"/> Generator <input checked="" type="checkbox"/> Engine
<i>If the equipment is a Generator, complete the rest of Question 10. If not, proceed to Question 11.</i>	
10.1.	Is the Generator Existing or New? <input type="checkbox"/> Existing <input type="checkbox"/> New
10.2.	Will the Generator Be Classified as an Emergency Generator or a Distributed Generator? <input type="checkbox"/> Emergency <input type="checkbox"/> Distributed
10.3.	Has an Initial Notification Pursuant to 7 DE Admin. Code 1144 Been Submitted for this Generator? <input type="checkbox"/> YES <input type="checkbox"/> NO
If NO, include a copy of the Initial Notification with this application.	
10.4.	Have the Emissions From the Generator Been Certified to Meet the Currently Applicable US EPA Non-Road Emission Standards? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
If YES, attach a copy of the Manufacturer's Certification. If NO, attach copies of any/all of the following: any maintenance or operating requirements/instructions provided by the generator manufacturer; the type, or a description, of any emission control equipment use; and/or emissions test data for the generator (such as a manufacturer's technical data sheet), any supporting documentation for any emission control equipment used, any supporting calculations, any quality control or assurance information, and any other information needed to demonstrate compliance with the requirements. Proceed to Question 11.	
11.	Primary Fuel: <input type="checkbox"/> Natural Gas <input type="checkbox"/> Biodiesel <input checked="" type="checkbox"/> Diesel <input type="checkbox"/> Other (specify): <input type="checkbox"/> Propane
11.1.	Maximum Annual Primary Fuel Consumption: 2,800 gal
11.2.	Heat Content of Primary Fuel: 140,000 BTU/gal
11.3.	Maximum Firing Rate: 17.5 gallons/hr
11.4.	Percent Sulfur of Primary Fuel: 0.0015 %
12.	Secondary Fuel: <input type="checkbox"/> Natural Gas <input type="checkbox"/> Biodiesel <input type="checkbox"/> Diesel <input type="checkbox"/> Other (specify): <input type="checkbox"/> Propane



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General Information

- 12.1. Maximum Annual Secondary Fuel Consumption: **MMCF**
- 12.2. Heat Content of Secondary Fuel: **BTU/CF**
- 12.3. Maximum Firing Rate: **MMCF/hr**
- 12.4. Percent Sulfur of Secondary Fuel: **%**
13. Is SCR/NSCR/SNCR/Ammonia Injection Used: ☐ YES ☐ NO

Stack Information

14. How Does the Process Equipment Vent:
(check all that apply)
☒ Directly to the Atmosphere
☐ Through a Control Device Covered by Forms AQM-4.1 through 4.12

If any of the process equipment vents directly to the atmosphere proceed to Question 15. If the process equipment vents through a control device, provide the stack parameters on the control device form and proceed to Question 16.

15. Emission Point Name: **Impact Crusher Engine**
- 15.1. Stack Height Above Grade: **15 feet**
- 15.2. Stack Exit Diameter: **0.5 feet**
(Provide Stack Dimensions If Rectangular Stack)
- 15.3. Is a Stack Cap Present? ☐ YES ☒ NO
- 15.4. Stack Configuration: ☐ Vertical ☒ Horizontal ☐ Downward-Venting
(check all that apply) ☐ Other (Specify):
- 15.5. Stack Exit Gas Temperature: **800 °F**
- 15.6. Stack Exit Gas Flow Rate: **3400 ACFM**
- 15.7. Distance to Nearest Property Line: **ft**
- 15.8. Describe Nearest Obstruction:
- 15.9. Height of Nearest Obstruction: **ft**
- 15.10. Distance to Nearest Obstruction: **ft**
- 15.11. Are Stack Sampling Ports Provided? ☐ YES ☒ NO

Monitoring Information

16. Will Emissions Data be Recorded by a Continuous Emission Monitoring System? ☐ YES ☒ NO
- If Yes, Attach a Copy of the Continuous Emission Monitoring System Manufacturer's Specification Sheets**
- If YES, complete the rest of Question 16. If NO, proceed to Question 17.*
- 16.1. Pollutants Monitored: ☐ VOCs ☐ HAPs ☐ PM ☐ PM₁₀ ☐ PM_{2.5} ☐ NO_x ☐ SO_x ☐ Metals
☐ Other (Specify):
- 16.2. Describe the Continuous Emission Monitoring System:



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<u>Monitoring Information</u>	
16.3.	Manufacturer:
16.4.	Model:
16.5.	Serial Number:
16.6.	Will Multiple Emission Units Be Monitored at the Same Point? <input type="checkbox"/> YES <input type="checkbox"/> NO
<i>If YES, complete the rest of Question 16. If NO, proceed to Question 17.</i>	
16.7.	Emission Units Monitored:
16.8.	Will More Than One Emission Unit be Emitting From the Combined Point At Any Time? <input type="checkbox"/> YES <input type="checkbox"/> NO
<i>If YES, complete the rest of Question 15. If NO, proceed to Question 17.</i>	
16.9.	Emission Units Emitting Simultaneously:

<u>Visible Emissions Monitoring Information</u>	
<i>For Primary Fuel</i>	
17.	Proposed Technique Used to Monitor Visible Emissions: <input type="checkbox"/> Opacity Monitor (COM) <input checked="" type="checkbox"/> Manual (Method 9) <input type="checkbox"/> Manual (Method 22) <input type="checkbox"/> Other (Describe):
<i>If an Opacity Monitor (COM) is used, complete the rest of Question 17. If not, proceed to Question 18.</i>	
17.1.	Describe the Continuous Opacity Monitoring System:
17.2.	Manufacturer:
17.3.	Model:
17.4.	Serial Number:
18.	Proposed Frequency of Opacity Monitoring: Once initially, if needed
<i>For Secondary Fuel. If no Secondary Fuel is used, proceed to Question 20.</i>	
19.	Proposed Technique Used to Monitor Visible Emissions: <input type="checkbox"/> Opacity Monitor (COMs) <input type="checkbox"/> Manual (Method 9) <input type="checkbox"/> Manual (Method 22) <input type="checkbox"/> Other (Describe):
<i>If an Opacity Monitor (COMs) is used, complete the rest of Question 19. If not, proceed to Question 20.</i>	
19.1.	Describe the Continuous Opacity Monitoring System:
19.2.	Manufacturer:
19.3.	Model:
19.4.	Serial Number:
20.	Proposed Frequency of Opacity Monitoring:



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Voluntary Emission Limitation Request Information

21. Are You Requesting Any Voluntary Emission Limitations to Avoid Major Source Status, Minor New Source Review, MACT, NSPS, etc.? ☐ YES ☒ NO

If YES, complete the rest of Question 21. If NO, proceed to Question 22.

21.1. Describe Any Proposed Emission Limitations:

Voluntary Operating Limitation Request Information

22. Are You Requesting Any Voluntary Operating Limitations to Avoid Major Source Status, Minor New Source Review, MACT, NSPS, etc.? ☐ YES ☒ NO

If YES, complete the rest of Question 22. If NO, proceed to Question 23.

22.1. Describe Any Proposed Operating Limitations:

Additional Information

23. Is There Any Additional Information Pertinent to this Application? ☒ YES ☐ NO

If YES, complete the rest of Question 23.

22.1. Describe: **See equipment specifications**



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Generator/Engine Application

If you are using this form electronically, press F1 at any time for help

<u>General Information</u>	
1.	Facility Name: Terra Technical Services, LLC
2.	Equipment ID: Eng 02
3.	Manufacturer: Caterpillar
4.	Model: C2.2
5.	Serial Number:
6.	Maximum Power Rating of Engine: 50 horsepower
7.	Standby Power Rating of Generator: 38 kilowatt
8.	Date of Manufacture:
9.	Installation Date: 2014
10.	Is the Equipment Being Applied For a Generator or an Engine? <input type="checkbox"/> Generator <input checked="" type="checkbox"/> Engine
<i>If the equipment is a Generator, complete the rest of Question 10. If not, proceed to Question 11.</i>	
10.1.	Is the Generator Existing or New? <input type="checkbox"/> Existing <input type="checkbox"/> New
10.2.	Will the Generator Be Classified as an Emergency Generator or a Distributed Generator? <input type="checkbox"/> Emergency <input type="checkbox"/> Distributed
10.3.	Has an Initial Notification Pursuant to 7 DE Admin. Code 1144 Been Submitted for this Generator? <input type="checkbox"/> YES <input type="checkbox"/> NO
If NO, include a copy of the Initial Notification with this application.	
10.4.	Have the Emissions From the Generator Been Certified to Meet the Currently Applicable US EPA Non-Road Emission Standards? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
If YES, attach a copy of the Manufacturer's Certification. If NO, attach copies of any/all of the following: any maintenance or operating requirements/instructions provided by the generator manufacturer; the type, or a description, of any emission control equipment use; and/or emissions test data for the generator (such as a manufacturer's technical data sheet), any supporting documentation for any emission control equipment used, any supporting calculations, any quality control or assurance information, and any other information needed to demonstrate compliance with the requirements. Proceed to Question 11.	
11.	Primary Fuel: <input type="checkbox"/> Natural Gas <input type="checkbox"/> Biodiesel <input checked="" type="checkbox"/> Diesel <input type="checkbox"/> Other (specify): <input type="checkbox"/> Propane
11.1.	Maximum Annual Primary Fuel Consumption: 500 gal
11.2.	Heat Content of Primary Fuel: 140,000 BTU/gal
11.3.	Maximum Firing Rate: 3 gallons/hr
11.4.	Percent Sulfur of Primary Fuel: 0.0015 %
12.	Secondary Fuel: <input type="checkbox"/> Natural Gas <input type="checkbox"/> Biodiesel <input type="checkbox"/> Diesel <input type="checkbox"/> Other (specify): <input type="checkbox"/> Propane



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General Information

- 12.1. Maximum Annual Secondary Fuel Consumption: **MMCF**
- 12.2. Heat Content of Secondary Fuel: **BTU/CF**
- 12.3. Maximum Firing Rate: **MMCF/hr**
- 12.4. Percent Sulfur of Secondary Fuel: **%**
13. Is SCR/NSCR/SNCR/Ammonia Injection Used: ☐ YES ☐ NO

Stack Information

14. How Does the Process Equipment Vent:
(check all that apply)
☒ Directly to the Atmosphere
☐ Through a Control Device Covered by Forms AQM-4.1 through 4.12

If any of the process equipment vents directly to the atmosphere proceed to Question 15. If the process equipment vents through a control device, provide the stack parameters on the control device form and proceed to Question 16.

15. Emission Point Name: **Edge TS 80 Stacker**
- 15.1. Stack Height Above Grade: **feet**
- 15.2. Stack Exit Diameter: **feet**
(Provide Stack Dimensions If Rectangular Stack)
- 15.3. Is a Stack Cap Present? ☐ YES ☐ NO
- 15.4. Stack Configuration: ☐ Vertical ☐ Horizontal ☐ Downward-Venting
(check all that apply) ☐ Other (Specify):
- 15.5. Stack Exit Gas Temperature: **°F**
- 15.6. Stack Exit Gas Flow Rate: **ACFM**
- 15.7. Distance to Nearest Property Line: **ft**
- 15.8. Describe Nearest Obstruction:
- 15.9. Height of Nearest Obstruction: **ft**
- 15.10. Distance to Nearest Obstruction: **ft**
- 15.11. Are Stack Sampling Ports Provided? ☐ YES ☒ NO

Monitoring Information

16. Will Emissions Data be Recorded by a Continuous Emission Monitoring System? ☐ YES ☒ NO
- If Yes, Attach a Copy of the Continuous Emission Monitoring System Manufacturer's Specification Sheets**
- If YES, complete the rest of Question 16. If NO, proceed to Question 17.*
- 16.1. Pollutants Monitored: ☐ VOCs ☐ HAPs ☐ PM ☐ PM₁₀ ☐ PM_{2.5} ☐ NO_x ☐ SO_x ☐ Metals
☐ Other (Specify):
- 16.2. Describe the Continuous Emission Monitoring System:



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<u>Monitoring Information</u>
16.3. Manufacturer:
16.4. Model:
16.5. Serial Number:
16.6. Will Multiple Emission Units Be Monitored at the Same Point? <input type="checkbox"/> YES <input type="checkbox"/> NO
<i>If YES, complete the rest of Question 16. If NO, proceed to Question 17.</i>
16.7. Emission Units Monitored:
16.8. Will More Than One Emission Unit be Emitting From the Combined Point At Any Time? <input type="checkbox"/> YES <input type="checkbox"/> NO
<i>If YES, complete the rest of Question 15. If NO, proceed to Question 17.</i>
16.9. Emission Units Emitting Simultaneously:

<u>Visible Emissions Monitoring Information</u>
<i>For Primary Fuel</i>
17. Proposed Technique Used to Monitor Visible Emissions: <input type="checkbox"/> Opacity Monitor (COM) <div style="margin-left: 400px;"> <input checked="" type="checkbox"/> Manual (Method 9) <input type="checkbox"/> Manual (Method 22) <input type="checkbox"/> Other (Describe): </div>
<i>If an Opacity Monitor (COM) is used, complete the rest of Question 17. If not, proceed to Question 18.</i>
17.1. Describe the Continuous Opacity Monitoring System:
17.2. Manufacturer:
17.3. Model:
17.4. Serial Number:
18. Proposed Frequency of Opacity Monitoring: Once initially, if needed
<i>For Secondary Fuel. If no Secondary Fuel is used, proceed to Question 20.</i>
19. Proposed Technique Used to Monitor Visible Emissions: <input type="checkbox"/> Opacity Monitor (COMs) <div style="margin-left: 400px;"> <input type="checkbox"/> Manual (Method 9) <input type="checkbox"/> Manual (Method 22) <input type="checkbox"/> Other (Describe): </div>
<i>If an Opacity Monitor (COMs) is used, complete the rest of Question 19. If not, proceed to Question 20.</i>
19.1. Describe the Continuous Opacity Monitoring System:
19.2. Manufacturer:
19.3. Model:
19.4. Serial Number:
20. Proposed Frequency of Opacity Monitoring:



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Voluntary Emission Limitation Request Information

21. Are You Requesting Any Voluntary Emission Limitations to Avoid Major Source Status, Minor New Source Review, MACT, NSPS, etc.? ☐ YES ☒ NO

If YES, complete the rest of Question 21. If NO, proceed to Question 22.

21.1. Describe Any Proposed Emission Limitations:

Voluntary Operating Limitation Request Information

22. Are You Requesting Any Voluntary Operating Limitations to Avoid Major Source Status, Minor New Source Review, MACT, NSPS, etc.? ☐ YES ☒ NO

If YES, complete the rest of Question 22. If NO, proceed to Question 23.

22.1. Describe Any Proposed Operating Limitations:

Additional Information

23. Is There Any Additional Information Pertinent to this Application? ☒ YES ☐ NO

If YES, complete the rest of Question 23.

22.1. Describe: **See equipment specifications**

Form AQM-3.9

*Crushed Stone
Equipment Application*



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Crushed Stone Equipment Application

If you are using this form electronically, press F1 at any time for help

<u>General Information</u>				
1. Facility Name: Terra Technical Services, LLC				
2. Equipment ID Number:				
3. Where Does the Stone Originate: <input checked="" type="checkbox"/> On-Site <div style="margin-left: 150px;"><input type="checkbox"/> Off-Site (Specify):</div>				
4. Locations Where Crusher Will Operate:				
If the Crusher will operate at more than five locations, attach additional copies of this page as needed. Note that state law requires that a public notice for each location be made.				
<u>Street Address</u>	<u>City</u>	<u>County</u>	<u>Zip Code</u>	<u>Condition of Roads at Location</u>
4.1. 321 Hillside Drive	Newark	New Castle	19717	<input type="checkbox"/> Paved <input type="checkbox"/> Unpaved <input checked="" type="checkbox"/> Both
4.2.				<input type="checkbox"/> Paved <input type="checkbox"/> Unpaved <input type="checkbox"/> Both
4.3.				<input type="checkbox"/> Paved <input type="checkbox"/> Unpaved <input type="checkbox"/> Both
4.4.				<input type="checkbox"/> Paved <input type="checkbox"/> Unpaved <input type="checkbox"/> Both
4.5.				<input type="checkbox"/> Paved <input type="checkbox"/> Unpaved <input type="checkbox"/> Both
Attach Proof of Local Zoning for each location.				
5. Material Crushed:				
If more than five Materials are crushed, attach additional copies of this page as needed.				
<u>Material Name</u>	<u>Material Description</u>			
5.1. Concrete	Concrete from demolition project			
5.2.				
5.3.				
5.4.				
5.5.				
6. Is a Feeder Used to Sort the Material Before Crushing? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO				
If YES, complete the rest of Question 6. If NO, proceed to Question 7.				
6.1. Is a Wet Suppression System Used to Control Emissions From the Feeder? <input type="checkbox"/> YES <input type="checkbox"/> NO				



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General Information

6.2. Feeder Power Provided By: ☐ Generator/Engine
☐ Utility
☐ Other (Specify):

If a Generator/Engine is used, include completed Form AQM-3.3 with this application.

Crusher Information

7. Number of Crushers: 1

If there are more than two Crushers, attach additional copies of this page as needed.

For Primary Crusher

8. Primary Crusher Identification: **Crusher 01**

8.1. Primary Crusher Manufacturer: **Sandvik**

8.2. Primary Crusher Model: **QI341 Impact Crusher**

8.3. Primary Crusher Serial Number: **QJ34100254**

8.4. Maximum Amount of Material Processed in Primary Crusher: **300 ton/hr**

8.5. Is a Wet Suppression System Used to Control Emissions from the Crusher? ☒ YES ☐ NO

8.6. Primary Crusher Power Provided By: ☒ Generator/Engine
☐ Utility
☐ Other (Specify):

If a Generator/Engine is Used, Include Completed Form AQM-3.3 With this Application

8.7. Is a Screen Used to Sort Crushed Material? ☐ YES ☒ NO

If YES, complete the rest of Question 8.7. If NO, proceed to Question 9.

8.7.1. Is a Wet Suppression System Used to Control Emissions from the Screen? ☐ YES ☐ NO

8.7.2. Screen Power Provided By: ☐ Generator/Engine
☐ Utility
☐ Other (Specify):

If a Generator/Engine is used, include completed Form AQM-3.3 with this application.

For the Secondary Crusher. If There is No Secondary Crusher, Proceed to Question 10.

9. Secondary Crusher Identification:

9.1. Manufacturer:

9.2. Model:

9.3. Serial Number:

9.4. Maximum Amount of Material Processed: **ton/hr**

9.5. Is a Wet Suppression System Used to Control Emissions from the Crusher? ☐ YES ☐ NO

9.6. Power Provided By: ☐ Generator/Engine
☐ Utility
☐ Other (Specify):

If a Generator/Engine is used, include completed Form AQM-3.3 with this application.



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<u>Crusher Information</u>
9.7. Is a Screen Used to Sort Crushed Material? <input type="checkbox"/> YES <input type="checkbox"/> NO
<i>If YES, complete the rest of Question 9.7. If NO, proceed to Question 10.</i>
9.7.1. Is a Wet Suppression System Used to Control Emissions From the Screen? <input type="checkbox"/> YES <input type="checkbox"/> NO
9.7.2. Screen Power Provided By: <input type="checkbox"/> Generator/Engine <input type="checkbox"/> Utility <input type="checkbox"/> Other (Specify):
If a Generator/Engine is used, include completed Form AQM-3.3 with this application.

<u>Conveyor Information</u>
10. Are Conveyors Used in the Process? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
<i>If YES, proceed to Question 11. If NO, proceed to Question 15.</i>
11. Number of Conveyors in Process: 2
If more than three Conveyors are used, attach additional copies of this page as needed.
<i>For the First Conveyor</i>
12. Conveyor Identification: Discharge Conveyor
12.1. Location: <input type="checkbox"/> Before (Specify Equipment): <input checked="" type="checkbox"/> After (Specify Equipment): Crusher 01 <input type="checkbox"/> Between (Specify Equipment):
12.2. Maximum Amount of Material Conveyed: 300 ton/hr
12.3. Is a Wet Suppression System Used to Control Emissions? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
12.4. Conveyor Power Provided By: <input checked="" type="checkbox"/> Generator/Engine <input type="checkbox"/> Utility <input type="checkbox"/> Other (Specify):
If a Generator/Engine is used, include completed Form AQM-3.3 with this application.
<i>For the Second Conveyor. If There Is No Second Conveyor, Proceed to Question 15.</i>
13. Conveyor Identification: TS 80 Stacking Conveyor
13.1. Location <input type="checkbox"/> Before (Specify Equipment): <input checked="" type="checkbox"/> After (Specify Equipment): TS 80 Stacker <input type="checkbox"/> Between (Specify Equipment):
13.2. Maximum Amount of Material Conveyed: 300 ton/hr
13.3. Is a Wet Suppression System Used to Control Emissions? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
13.4. Conveyor Power Provided By: <input checked="" type="checkbox"/> Generator/Engine <input type="checkbox"/> Utility <input type="checkbox"/> Other (Specify):
If a Generator/Engine is used, include completed Form AQM-3.3 with this application.
<i>For the Third Conveyor. If There Is No Third Conveyor, Proceed to Question 15.</i>
14. Conveyor Identification:



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Conveyor Information

- 14.1. Location: ☐ Before (Specify Equipment):
☐ After (Specify Equipment):
☐ Between (Specify Equipment):

14.2. Maximum Amount of Material Conveyed: **ton/hr**

14.3. Is a Wet Suppression System Used to Control Emissions? ☐ YES ☐ NO

14.4. Conveyor Power Provided By: ☐ Generator/Engine
☐ Utility
☐ Other (Specify):

If a Generator/Engine is used, include completed Form AQM-3.3 with this application.

Fines Crushing Information

15. Do you perform any of the following activities at your facility: ☐ Pulverize Minerals
☐ Produce Sand
☐ Crush Stone Into a Fine Product

If you checked any of the boxes above, include complete Form AQM-3.10 with this application.

Visible Emissions Monitoring Information

16. Proposed Technique Used to Monitor Visible Emissions: ☐ Opacity Monitor (COM)
☒ Manual (Method 9)
☐ Manual (Method 22)
☐ Other (Describe):

If an Opacity Monitor (COM) is used, complete the rest of Question 16. If not, proceed to Question 17.

16.1. Describe the Continuous Opacity Monitoring System:

16.2. Manufacturer:

16.3. Model:

16.4. Serial Number:

17. Proposed Frequency of Opacity Monitoring:

Voluntary Emissions Limitation Request Information

18. Are You Requesting Any Voluntary Emission Limitations to Avoid Major Source Status, Minor New Source Review, MACT, NSPS, etc.? ☐ YES ☒ NO

If YES, complete the rest of Question 18. If NO, proceed to Question 19.

19.1. Describe Any Proposed Emission Limitations:



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Voluntary Operating Limitation Request Information

19. Are You Requesting Any Voluntary Operating Limitations to Avoid Major Source Status, Minor New Source Review, MACT, NSPS, etc.? ☐ YES ☒ NO

If YES, complete the rest of Question 19. If NO, proceed to Question 20.

19.1. Describe Any Proposed Operating Limitations:

Additional Information

20. Is There Any Additional Information Pertinent to this Application? ☐ YES ☒ NO

If YES, complete the rest of Question 20.

20.1. Describe:

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Emission Information Application



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Emissions Information Application

If you are using this form electronically, press F1 at any time for help

Process Information

1. Number of Individual Pieces of Process Equipment in Process: **2**
2. Number of Individual Control Devices in Process: **0**

Emissions Information for First Emission Point/Stack

3. Emission Point Name: **Crusher Engine**
4. Equipment ID Number for all Process Equipment and Control Devices Venting Through Emission Point/Stack: **Eng 01**
5. Pollutant Emissions

If more than 15 pollutants are emitted at this Emission Point/Stack, attach additional copies of this page as needed.

<u>Pollutant Name</u> (Specify VOCs and HAPs Individually in 5.10 through 5.18)	<u>CAS Number</u> (Not required for 5.1 through 5.10)	<u>Maximum Uncontrolled Emission Rate at Design Capacity</u>	<u>Maximum Controlled Emission Rate at Design Capacity</u>	<u>Annual Potential to Emit (PTE)</u>	<u>Requested Permitted Annual Emissions</u>
5.1. Particulate Matter (PM)		0.012 lbs/hour	0.012 lbs/hour	0.053 tons/year	0.001 tons/year
5.2. PM ₁₀		0.012 lbs/hour	0.012 lbs/hour	0.053 tons/year	0.001 tons/year
5.3. PM _{2.5}		0.012 lbs/hour	0.012 lbs/hour	0.053 tons/year	0.001 tons/year
5.4. Sulfur Oxides (SO _x)		0.0039 lbs/hour	0.0039 lbs/hour	0.017 tons/year	0.0003 tons/year
5.5. Nitrogen Oxides (NO _x)		0.23 lbs/hour	0.23 lbs/hour	1.01 tons/year	0.019 tons/year
5.6. Carbon Monoxide (CO)		2.01 lbs/hour	2.01 lbs/hour	8.8 tons/year	0.16 tons/year
5.7. Total Volatile Organic Compounds (VOCs)		0.11 lbs/hour	0.11 lbs/hour	0.48 tons/year	0.0086 tons/year
5.8. Total Hazardous Air		lbs/hour	lbs/hour	tons/year	tons/year



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Emissions Information for First Emission Point/Stack

Pollutants (HAPs)					
5.9. CO ₂	lbs/hour	lbs/hour	tons/year	tons/year	
5.10. CO _{2e}	lbs/hour	lbs/hour	tons/year	tons/year	
5.11.	lbs/hour	lbs/hour	tons/year	tons/year	
5.12.	lbs/hour	lbs/hour	tons/year	tons/year	
5.13.	lbs/hour	lbs/hour	tons/year	tons/year	
5.14.	lbs/hour	lbs/hour	tons/year	tons/year	
5.15.	lbs/hour	lbs/hour	tons/year	tons/year	

6. Provide Any Additional Information Necessary to Understanding the Emission Rates Provided Above:

Attach the Basis of Determination or Calculations for each Emission Rate provided above.

Emissions Information for Second Emission Point/Stack

7. Emission Point Name: **Stacker Engine**
8. Equipment ID Number for all Process Equipment and Control Devices Venting Through Emission Point/Stack: **Eng 02**
9. Pollutant Emissions

If more than 15 pollutants are emitted at this Emission Point/Stack, attach additional copies of this page as needed.

Pollutant Name (Specify VOCs and HAPs Individually in 9.10 through 9.18)	CAS Number (Not required for 9.1 through 9.10)	Maximum Uncontrolled Emission Rate at Design Capacity	Maximum Controlled Emission Rate at Design Capacity	Annual Potential to Emit (PTE)	Requested Permitted Annual Emissions
9.1. Particulate Matter (PM)		0.0025 lbs/hour	0.0025 lbs/hour	0.011 tons/year	0.0002 tons/year
9.2. PM ₁₀		0.0025 lbs/hour	0.0025 lbs/hour	0.011 tons/year	0.0002 tons/year



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Emissions Information for Second Emission Point/Stack

					tons/year
9.3.	PM _{2.5}	0.0025 lbs/hour	0.0025 lbs/hour	0.011 tons/year	0.0002 tons/year
9.4.	Sulfur Oxides (SO _x)	0.00065 lbs/hour	0.00065 lbs/hour	0.0028 tons/year	0.0001 tons/year
9.5.	Nitrogen Oxides (NO _x)	0.35 lbs/hour	0.35 lbs/hour	1.53 tons/year	0.028 tons/year
9.6.	Carbon Monoxide (CO)	0.11 lbs/hour	0.11 lbs/hour	0.48 tons/year	0.0086 tons/year
9.7.	Total Volatile Organic Compounds (VOCs)	0.019 lbs/hour	0.019 lbs/hour	0.083 tons/year	0.0015 tons/year
9.8.	Total Hazardous Air Pollutants (HAPs)	lbs/hour	lbs/hour	tons/year	tons/year
9.9.	CO ₂	lbs/hour	lbs/hour	tons/year	tons/year
9.10.	CO _{2e}	lbs/hour	lbs/hour	tons/year	tons/year
9.11.		lbs/hour	lbs/hour	tons/year	tons/year
9.12.		lbs/hour	lbs/hour	tons/year	tons/year
9.13.		lbs/hour	lbs/hour	tons/year	tons/year
9.14.		lbs/hour	lbs/hour	tons/year	tons/year
9.15.		lbs/hour	lbs/hour	tons/year	tons/year

10. Provide Any Additional Information Necessary to Understanding the Emission Rates Provided Above:

Attach the Basis of Determination or Calculations for each Emission Rate provided above.

Emissions Information for Third Emission Point/Stack

11. Emission Point Name: **Sandvik Q1341 Impact Crusher Fugitive Emissions**



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Emissions Information for Third Emission Point/Stack

12. Equipment ID Number for all Process Equipment and Control Devices Venting Through Emission Point/Stack: Crusher 01					
13. Pollutant Emissions					
If more than 15 pollutants are emitted at this Emission Point/Stack, attach additional copies of this page as needed.					
Pollutant Name (Specify VOCs and HAPs Individually in 13.10 through 13.18)	CAS Number (Not required for 13.1 through 13.10)	Maximum Uncontrolled Emission Rate at Design Capacity	Maximum Controlled Emission Rate at Design Capacity	Annual Potential to Emit (PTE)	Requested Permitted Annual Emissions
13.1. Particulate Matter (PM)		2.52 lbs/hour	0.40 lbs/hour	11 tons/year	0.032 tons/year
13.2. PM ₁₀		1.05 lbs/hour	0.18 lbs/hour	4.60 tons/year	0.014 tons/year
13.3. PM _{2.5}		1.05 lbs/hour	0.034 lbs/hour	4.6 tons/year	0.0027 tons/year
13.4. Sulfur Oxides (SO _x)		lbs/hour	lbs/hour	tons/year	tons/year
13.5. Nitrogen Oxides (NO _x)		lbs/hour	lbs/hour	tons/year	tons/year
13.6. Carbon Monoxide (CO)		lbs/hour	lbs/hour	tons/year	tons/year
13.7. Total Volatile Organic Compounds (VOCs)		lbs/hour	lbs/hour	tons/year	tons/year
13.8. Total Hazardous Air Pollutants (HAPs)		lbs/hour	lbs/hour	tons/year	tons/year
13.9. CO ₂		lbs/hour	lbs/hour	tons/year	tons/year
13.10. CO _{2e}		lbs/hour	lbs/hour	tons/year	tons/year
13.11.		lbs/hour	lbs/hour	tons/year	tons/year
13.12.		lbs/hour	lbs/hour	tons/year	tons/year
13.13.		lbs/hour	lbs/hour	tons/year	tons/year
13.14.		lbs/hour	lbs/hour	tons/year	tons/year
13.15.		lbs/hour	lbs/hour	tons/year	tons/year



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Emissions Information for Third Emission Point/Stack

14. Provide Any Additional Information Necessary to Understanding the Emission Rates Provided Above:

Attach the Basis of Determination or Calculations for each Emission Rate provided above.

Emissions Information for Fourth Emission Point/Stack

15. Emission Point Name: **Edge TS 80 Stacker Fugitive Emissions**

16. Equipment ID Number for all Process Equipment and Control Devices Venting Through Emission Point/Stack:

17. Pollutant Emissions

If more than 15 pollutants are emitted at this Emission Point/Stack, attach additional copies of this page as needed.

Pollutant Name (Specify VOCs and HAPs Individually in 17.10 through 17.18)	CAS Number (Not required for 17.1 through 17.10)	Maximum Uncontrolled Emission Rate at Design Capacity	Maximum Controlled Emission Rate at Design Capacity	Annual Potential to Emit (PTE)	Requested Permitted Annual Emissions
17.1. Particulate Matter (PM)		0.90 lbs/hour	0.04 lbs/hour	3.94 tons/year	0.0034 tons/year
17.2. PM ₁₀		0.33 lbs/hour	0.01 lbs/hour	1.45 tons/year	0.0011 tons/year
17.3. PM _{2.5}		0.33 lbs/hour	0.01 lbs/hour	1.45 tons/year	0.0011 tons/year
17.4. Sulfur Oxides (SO _x)		lbs/hour	lbs/hour	tons/year	tons/year
17.5. Nitrogen Oxides (NO _x)		lbs/hour	lbs/hour	tons/year	tons/year
17.6. Carbon Monoxide (CO)		lbs/hour	lbs/hour	tons/year	tons/year
17.7. Volatile Organic Compounds (VOCs)		lbs/hour	lbs/hour	tons/year	tons/year
17.8. Total Hazardous Air Pollutants (HAPs)		lbs/hour	lbs/hour	tons/year	tons/year
17.9. CO ₂		lbs/hour	lbs/hour	tons/year	tons/year



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Emissions Information for Fourth Emission Point/Stack

17.10. CO _{2e}	lbs/hour	lbs/hour	tons/year	tons/year
17.11.	lbs/hour	lbs/hour	tons/year	tons/year
17.12.	lbs/hour	lbs/hour	tons/year	tons/year
17.13.	lbs/hour	lbs/hour	tons/year	tons/year
17.14.	lbs/hour	lbs/hour	tons/year	tons/year
17.15.	lbs/hour	lbs/hour	tons/year	tons/year

18. Provide Any Additional Information Necessary to Understanding the Emission Rates Provided Above:

Attach the Basis of Determination or Calculations for each Emission Rate provided above.

If there are more than four Emission Points/Stacks, attach additional copies of this form as needed.

Overall Process Emissions

19. Pollutant Emissions					
If more than 15 pollutants are emitted from this Process, attach additional copies of this page as needed.					
Pollutant Name (Specify VOCs and HAPs Individually in 19.10 through 19.18)	CAS Number (Not required for 19.1 through 19.10)	Maximum Uncontrolled Emission Rate at Design Capacity	Maximum Controlled Emission Rate at Design Capacity	Annual Potential to Emit (PTE)	Requested Permitted Annual Emissions
19.1. Particulate Matter (PM)		3.43 lbs/hour	1.42 lbs/hour	15.02 tons/year	0.037 tons/year
19.2. PM ₁₀		1.39 lbs/hour	0.87 lbs/hour	6.09 tons/year	0.016 tons/year
19.3. PM _{2.5}		1.39 lbs/hour	0.38 lbs/hour	6.09 tons/year	0.0044 tons/year
19.4. Sulfur Oxides (SO _x)		0.0044 lbs/hour	0.0044 lbs/hour	0.019 tons/year	0.0004 tons/year
19.5. Nitrogen Oxides (NO _x)		0.58 lbs/hour	0.58 lbs/hour	2.54 tons/year	0.047 tons/year



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Overall Process Emissions

19.6.	Carbon Monoxide (CO)	2.11 lbs/hour	2.11 lbs/hour	9.24 tons/year	0.17 tons/year
19.7.	Total Volatile Organic Compounds (VOCs)	0.13 lbs/hour	0.13 lbs/hour	0.57 tons/year	0.01 tons/year
19.8.	Total Hazardous Air Pollutants (HAPs)	lbs/hour	lbs/hour	tons/year	tons/year
19.9.	CO ₂	lbs/hour	lbs/hour	tons/year	tons/year
19.10.	CO _{2e}	lbs/hour	lbs/hour	tons/year	tons/year
19.12.		lbs/hour	lbs/hour	tons/year	tons/year
19.13.		lbs/hour	lbs/hour	tons/year	tons/year
19.14.		lbs/hour	lbs/hour	tons/year	tons/year
19.15.		lbs/hour	lbs/hour	tons/year	tons/year

20. Provide Any Additional Information Necessary to Understanding the Emission Rates Provided Above:

Attach the Basis of Determination or Calculations for each Emission Rate provided above.

Minor New Source Review Information

21.	Does the Process Have the Potential to Emit More Than Five Tons Per Year of Any Pollutant?	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
22.	Is the Source New or Existing?	<input checked="" type="checkbox"/> NEW <input type="checkbox"/> EXISTING
See Question 11 of AQM-1		
If the Process has the Potential to Emit more than five tons per year of any pollutant, and is a New Source, a Control Technology Analysis pursuant to Regulation No. 1125 Section 4 must be conducted and attached to this application.		

Major New Source Review Information

23. Does the Process Have the Potential to Emit More Than the Significance Level for Any Pollutant? (Check All That Apply)



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- ☐ Greater Than 25 Tons Per Year of Particulate Matter (PM)
- ☐ Greater Than 15 Tons Per Year of PM₁₀
- ☐ Greater Than 10 Tons Per Year of PM_{2.5}
- ☐ Greater Than 40 Tons Per Year of Sulfur Dioxide(SO₂)
- ☐ Greater Than 25 Tons Per Year of Nitrogen Oxides (NO_x) in New Castle and Kent County
- ☐ Greater Than 100 Tons Per Year of Nitrogen Oxides (NO_x) in Sussex County
- ☐ Greater Than 100 Tons Per Year of Carbon Monoxide (CO)
- ☐ Greater Than 25 Tons Per Year of Total Volatile Organic Compounds (VOCs) in New Castle and Kent County
- ☐ Greater Than 50 Tons Per Year of Total Volatile Organic Compounds (VOCs) in Sussex County
- ☐ Greater Than 75,000 Tons Per Year of Equivalent Carbon Dioxide (CO_{2e})

If the Process has the Potential to Emit greater than any of the amounts listed above 7 DE Admin. Code 1125 Sections 2 and/or 3 apply. Contact the Department at (302) 323-4542 or (302) 739-9402 for additional information

Additional Information

24. Is There Any Additional Information Pertinent to this Application? ☒ YES ☐ NO

If YES, complete the rest of Question 24.

24.1. Describe: **See emissions calculations.**

Emission Calculations

Terra Technical Services, LLC - University of Delaware, DE
Emissions Calculations - Sandvik QJ341 Impact Crusher

Equipment	Max Output ¹	PM Emissions ²			CO Emissions ²	NOx Emissions ²	SO2 Emissions ³	NMHC Emissions ²
Caterpillar C9.3 Diesel Engine (S/N CS900616)	350 HP 262 kW	PM ⁴	PM 10 ⁴	PM 2.5 ⁴	Based on 350 HP / 262 kW	Based on 350 HP / 262 kW	Based on Sulfur Content of Fuel	Based on 350 HP / 262 kW
					0.015 g/hp-hr	0.30 g/hp-hr		0.14 g/hp-hr
					0.012 lb/hr	0.232 lb/hr	0.00378 lb/hr	0.108 lb/hr
					1.85 lb/yr	321.05 lb/yr	37.04 lb/yr	17.29 lb/yr
	160 hrs/yr		0.0009 ton/yr	0.0009 ton/yr	0.1605 ton/yr	0.0185 ton/yr	0.00030 ton/yr	0.0086 ton/yr

Equipment	Max Output ⁴	Uncontrolled PM Emissions ⁵			Controlled PM Emissions ⁵		
Sandvik QJ341 Crusher (S/N QJ34100254)	160 hrs/yr 300 ton/hr ⁷ (maximum)	PM ³	PM 10 ^{5, 6}	PM 2.5 ^{5, 6}	PM ⁵	PM 10 ⁵	PM 2.5 ⁵
		5.40E-03 lb/ton ⁵	2.40E-03 lb/ton ⁵	2.40E-03 lb/ton ⁵	1.20E-03 lb/ton ⁵	5.40E-04 lb/ton ⁵	1.00E-04 lb/ton ⁵
		1.6200 lb/hr	0.7200 lb/hr	0.7200 lb/hr	0.3600 lb/hr	0.1620 lb/hr	0.0300 lb/hr
		259.20 lb/yr	115.20 lb/yr	115.20 lb/yr	57.60 lb/yr	25.92 lb/yr	4.80 lb/yr
	0.1296 ton/yr	0.0576 ton/yr	0.0576 ton/yr	0.0576 ton/yr	0.0288 ton/yr	0.0130 ton/yr	0.0024 ton/yr

Equipment	Max Output ⁴	Uncontrolled PM Emissions ⁵			Controlled PM Emissions ⁵		
Sandvik QJ341 Discharge Conveyor	160 hrs/yr 300 ton/hr ⁷ (maximum)	PM ³	PM 10 ^{5, 6}	PM 2.5 ^{5, 6}	PM ⁵	PM 10 ⁵	PM 2.5 ⁵
		3.00E-03 lb/ton ⁵	1.10E-03 lb/ton ⁵	1.10E-03 lb/ton ⁵	1.40E-04 lb/ton ⁵	4.60E-05 lb/ton ⁵	1.30E-05 lb/ton ⁵
		0.9000 lb/hr	0.3300 lb/hr	0.3300 lb/hr	0.0420 lb/hr	0.0138 lb/hr	0.0039 lb/hr
		144.00 lb/yr	52.80 lb/yr	52.80 lb/yr	6.72 lb/yr	2.21 lb/yr	0.62 lb/yr
	0.0720 ton/yr	0.0264 ton/yr	0.0264 ton/yr	0.0264 ton/yr	0.0034 ton/yr	0.0011 ton/yr	0.0003 ton/yr

Equipment	Max Output	PM Emissions			CO Emissions	NOx Emissions	SOx Emissions	NMHC Emissions
Caterpillar C2.2 Diesel Engine (Stacker Engine)	50 HP 37 kW 3 gal/hr ⁹ 10 hrs/day	PM ⁴	PM 10 ⁴	PM 2.5 ⁴	Based on 50 HP / 37 kW	Based on 50 HP / 37 kW	Based on Fuel Use and Sulfur Content	Based on 50 HP / 37 kW
					0.030 g/kw-hr	0.030 g/kw-hr	1.300 g/kw-hr	4.275 g/kw-hr
					0.0025 lb/hr	0.002 lb/hr	0.107 lb/hr	0.353 lb/hr
					0.025 lb/day	0.025 lb/day	1.072 lb/day	3.526 lb/day
Tier 4 Engine	160 hrs/yr	0.036 lb/yr	0.002 ton/yr	0.002 ton/yr	0.396 lb/yr	0.396 lb/yr	17.158 lb/yr	56.422 lb/yr
					0.0002 ton/yr	0.0002 ton/yr	0.0086 ton/yr	0.0282 ton/yr
							0.104 lb/yr	0.104 lb/yr
							0.0001 ton/yr	0.0001 ton/yr
								0.0015 ton/yr

Equipment	Max Output	PM Emissions (Uncontrolled)			Controlled PM Emissions ⁵		
Edge TS 80 Stacker	160 hr/yr 300 ton/hr ² 10 hrs/day	PM (TSP)	PM 10	PM 2.5	PM ⁵	PM 10 ⁵	PM 2.5 ⁵
					0.003 lb/ton	0.0011 lb/ton	1.40E-04 lb/ton ⁵
					0.90 lb/hr	0.33 lb/hr	0.04 lb/hr
					9.00 lb/day	3.30 lb/day	0.42 lb/day
(or Equivalent)	(maximum)	0.07 ton/yr	0.03 ton/yr	0.03 ton/yr	53 lb/yr	53 lb/yr	6.72 lb/yr
							2.21 lb/yr
							1.17 lb/yr
							0.0006 ton/yr

Total Uncontrolled PM Emissions				Total Controlled PM Emissions		
PM				PM 10	PM 2.5	PM 2.5
3.4341 lb/hr				1.3941 lb/hr	1.3941 lb/hr	0.8700 lb/hr
549.45 lb/yr				223.05 lb/yr	223.05 lb/yr	32.58 lb/yr
0.2747 ton/yr				0.1115 ton/yr	0.1115 ton/yr	0.0163 ton/yr
						0.0044 ton/yr

Notes:

- 1). Caterpillar Model CAT C9.3 diesel engine is Tier 4 Interim CARB certified.
- 2). Based on Tier 4 Interim emissions certification for engine family ECPXL09.3HPB. Tier 4 USEPA exhaust emission standards for nonroad compression-ignition engines, 130 < kW<560. (40 CFR 1039.102)
- 3). SOx based on an average fuel consumption of 17.5 gallons/hour at a maximum sulfur content of 0.0015% for diesel fuel.
- 4).Footnote in AP-42, Table 3.3-1 - All particulate is assumed to be less than or equal to 1µ in size.
- 5). Uncontrolled and controlled emission factors based on AP-42, Table 11.19.2-2 for tertiary crushing and conveyor transfer points.
- 6). AP-42 does not indicate an emission factor for uncontrolled PM emissions, thus it is assumed that PM 2.5 = PM 10.
- 7). Estimated maximum capacity of crusher per Sandvik QJ341 Jaw Crusher Technical Specification.
- 8). The crusher will be processing 10 hours a day for four days a week, totaling 160 hours at the University of Delaware location.
- 9). Engine fuel consumption and emissions based on engines of the same model in similar equipment.

Assumptions:

1 g	0.002205 lbs
Total Hours per year	160 hrs/yr
Engine Max Output	350 hp
	262 kw
Diesel Sulfur Content	0.0015% %
Fuel Consumption	17.5 gal/hr
Max Crusher Output	300 ton/hr
Density of Diesel Fuel	7.2 lbs/gallon

Equipment Specifications

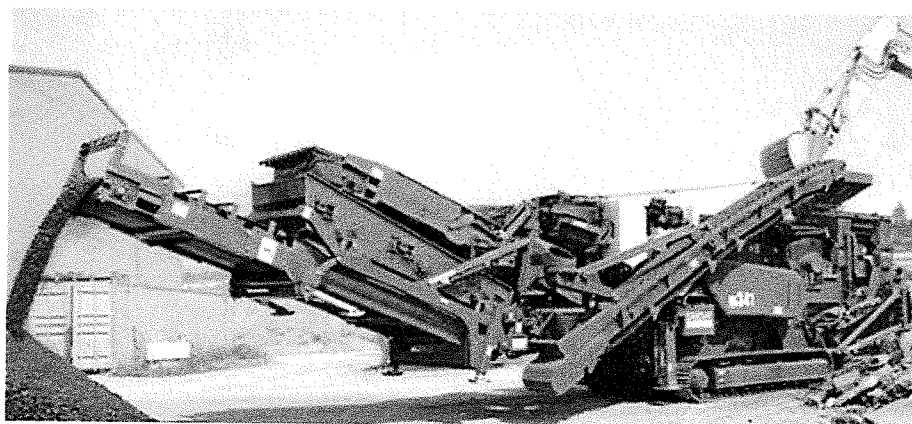
Sandvik QI341 Impact Crusher & Engine



HOME > PRODUCTS > MOBILE CRUSHERS AND SCREENS > MOBILE IMPACT CRUSHERS > QI341 MOBILE IMPACT CRUSHER

QI341 MOBILE IMPACT CRUSHER

QI341 MOBILE IMPACT CRUSHER



Sandvik QI341 mobile impact crusher is the most versatile and cost effective mid-sized unit on the market. Fitted with the CI411 Prisec™ impactor, this unit can operate in both primary and secondary applications.

This fully mobile, compact impact crusher is designed to meet the tightest end-product specifications while providing the operator an unparalleled level of flexibility, productivity and control. The compact dimensions of Sandvik QI341 mobile impactor make it ideal for sites where space is limited, but where superb product shape and high levels of production are required.

The unique crescent profile design of the hammers ensures maximum reduction of material, even as the hammers wear. The 992 x 670 mm (39 x 27 in.) feed opening can be raised by radio control, and the rotor speed is adjustable to control fines production. Available in open or closed circuit versions, Sandvik QI341 mobile impact crusher is the ultimate contractor machine.

Other models within this range include Sandvik QI441 mobile impact crusher.

Advantages

- User friendly PLC control system and color screen for ease of operation

- Raise/lower capability on the main conveyor, magnet and ceramic blow bars as standard
- Adjustable tip speed for precise end-product refinement
- Reversible hydraulically-driven cooling fan with automatic backflush feature
- Wear-resistant feeder liner plates are standard, reducing wear cost

Technical data

Equipment	Sandvik CI411 Prisec™ Impactor
Feed opening	992 x 670 mm (39 x 26 ½ in.)
Maximum feed size	600 mm (23 ⅝ in.)
Engine	C9 / C9.3 Acert 261 kW (350 hp)
Transport length	14.08 m (46 ft 2 in.)
Transport width	2.50 m (8 ft 2 in.)
Transport height	3.40 m (11 ft 2 in.)
Weight	37,200 kg (82,012 lbs)
Weight (with HS option)	44,978 kg (99,160 lbs)

Please note all weights and dimensions are for standard units only.

Former Names: Extec I-C13, QI340 Mobile impact crusher

Downloads

[qi341-specification-sheet-english.pdf](#) (PDF DOCUMENT, 1.7 MB)

[qi341hs-specification-sheet-english.pdf](#) (PDF DOCUMENT, 546 KB)

[qi341-brochure-english.pdf](#) (PDF DOCUMENT, 1.9 MB)

Related products



QI441 Mobile impact crusher

Sandvik QI441 mobile impact crusher is a pioneering solution offering primary and secondary crushing in one unit. Maximum productivity and efficiency in a single investment.

Versatile mobile impact crushers

Sandvik QI341 mobile impact crusher is a versatile, long-life impactor engineered to deliver exceptional reduction ratios across a broad range of applications. Hydraulic raise and lower capability provides increased clearance for rebar discharge in recycling applications. A large

capacity vibrating feeder with wear resistant liner plates comes standard, and continuous engine-load monitoring regulates the feeder speed to further reduce blockages and wear.

This heavy duty mobile impact crusher is the ideal combination of performance and low operating cost. The emissions-compliant 261kW (350hp) engine is both powerful and fuel efficient, while a large capacity 660 litre (174 gallon) diesel tank ensures long-running throughput. Easy maintenance is designed in, with quick access to the engine compartment, and a lifting jib and blow bar cradle supplied as standard.

To offer an even greater return on your impactor investment, Sandvik QI341 mobile impact crusher is also available with an optional hanging screen system, providing the ability to produce accurately sized products for immediate use. With a choice of pre-screen media, and 50°C ambient temperature operating capability without the need for an oil change, Sandvik QI341 mobile impactor is designed for the most hostile work environments.

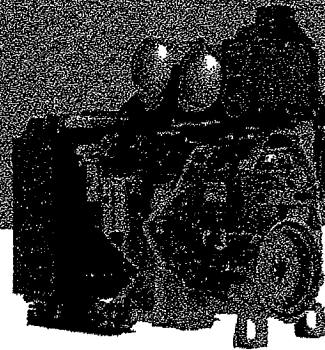
Sandvik is an engineering group in mining and rock excavation, metal-cutting, and materials technology.
Visit [Sandvik Group's website](#)

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HIGHLY REGULATED

C9.3 ACERT

POWER UNIT



Specifications

	U.S. EPA Tier 4 Interim, EU Stage IIIB	U.S. EPA Tier 4 Final, EU Stage IV
Engine Configuration	In-Line 6, Diesel	In-Line 6, Diesel
Bore x Stroke	115 x 149 mm (4.53 x 5.87 in)	115 x 149 mm (4.53 x 5.87 in)
Displacement	9.3 liters (567.5 in ³)	9.3 liters (567.5 in ³)
Ship Weight	1839 kg (4055 lbs)	1678 kg (3699 lbs)
Approximate Dimensions:		
Length	1845 mm (72.6 in)	2042 mm (80.4 in)
Width	1118 mm (44.0 in)	1094 mm (43.1 in)
Height	1554 mm (61.2 in)	1741 mm (68.5 in)

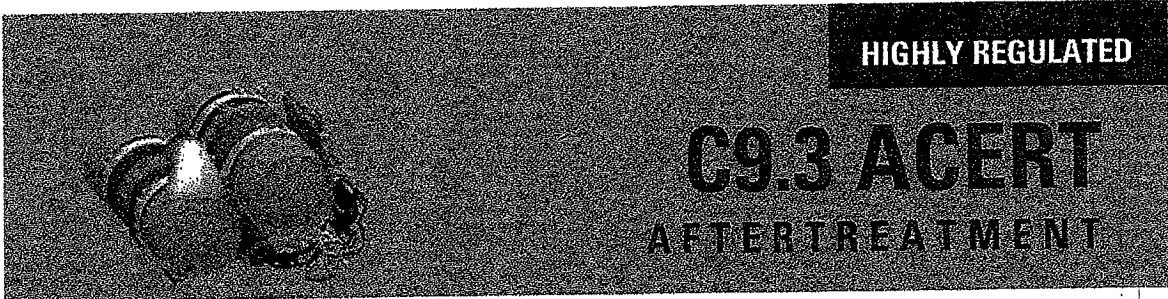
U.S. EPA Tier 4 Interim, EU Stage IIIB Ratings

A Rating (Continuous)			B Rating			C Rating (Intermittent)		
bkW	bhp	rpm	bkW	bhp	rpm	bkW	bhp	rpm
TA (ATAAC)								
224	300	1800- 2200	242	325	1800- 2200	261	350	1800- 2200

U.S. EPA Tier 4 Final, EU Stage IV Ratings

A Rating (Continuous)			B Rating			C Rating (Intermittent)			D Rating		
bkW	bhp	rpm	bkW	bhp	rpm	bkW	bhp	rpm	bkW	bhp	rpm
TA (ATAAC)											
224	300	1800- 2200	242	325	1800- 2200	261	350	1800- 2200	290	389	1800- 2200
—	—	—	—	—	—	—	—	—	298	400	2000

Emission standards: U.S. EPA Tier 4 Interim or U.S. EPA Tier 4 Final, EU Stage IIIB or EU Stage IV



HIGHLY REGULATED

C9.3 ACERT

AFTERTREATMENT

Specifications

	U.S. EPA Tier 4 Interim, EU Stage IIIB
Approximate Dimensions:	
Length	925.89 mm (36.45 in)
Width	714.4 mm (28.12 in)
Height	392.21 mm (15.44 in)
Weight	130 kg (287 lbs)
Diameter	304.8 mm (12 in)

Multiple customizable configuration options available

Standard Emissions Control Equipment

- Cat Regeneration System
- **CEM:** Clean Emissions Module, including:
 - **DOC:** Diesel Oxidation Catalyst
 - **DPF:** Diesel Particulate Filter
- **NRS:** NOx Reduction System

Specifications

	U.S. EPA Tier 4 Final, EU Stage IV	
	Standard Configuration	PETU Configuration up to 48.4 L (51.1 U.S. qt)
Approximate Dimensions:		
Length	885 mm (34.8 in)	854 mm (33.6 in)
Width	870 mm (34.25 in)	287 mm (11.3 in)
Height	570 mm (22.4 in)	551 mm (21.7 in)
Weight	212 kg (467 lbs)	19.42 kg (42.8 lbs)

Standard Emissions Control Equipment

- Cat Regeneration System
- **CEM:** Clean Emissions Module, including:
 - **DOC:** Diesel Oxidation Catalyst
 - **DPF:** Diesel Particulate Filter
- **ECU:** Aftertreatment Electronic Control Unit
- **NRS:** NOx Reduction System
- **PETU:** Pump Electronic Tank Unit
- **SCR:** Selective Catalytic Reduction



C9.3 ACERT™ Industrial Engine

Tier 4 Interim/Stage IIIB

224-261 kW (300-350 bhp) @ 1800-2200 rpm

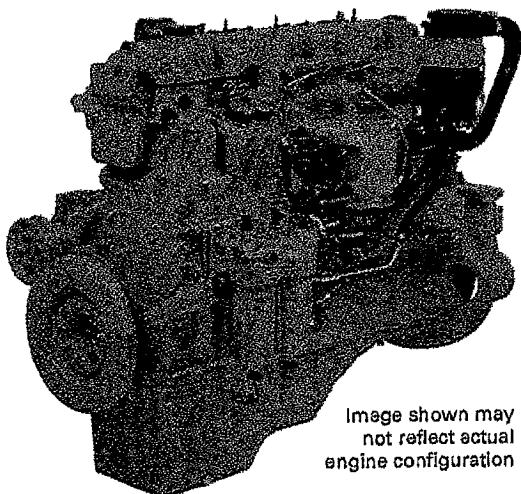


Image shown may
not reflect actual
engine configuration

CAT® ENGINE SPECIFICATIONS

I-6, 4-Stroke-Cycle Diesel

Bore 115 mm (4.53 in)
Stroke 149 mm (5.87 in)
Displacement 9.3 L (587.5 in³)
Aspiration Turbocharged-Aftercooled
Compression Ratio 17.0:1
Combustion System Direct Injection
Rotation (from flywheel end) ... Counterclockwise
Capacity for Liquids

Cooling System (includes engine,
lines, radiator, shunt tank) 54 L (57.0 U.S. qts)

Lube System (refill)* 30 L (31.7 U.S. qts)

Engine Weight, Net Dry

(approximate) 885 kg (1950 lbs)

*Capable of up to 500-hour oil change interval,
dependent on oil pan size, rating, application,
operating conditions, and maintenance practices.

FEATURES

Emissions

Designed to meet 2011 EPA (U.S.) Tier 4 Interim and EU Stage IIIB emissions requirements. Also expected to meet Japanese MLIT emissions requirements once available.

Reliable, Quiet, and Durable Power

World-class manufacturing capability and processes coupled with proven core engine designs assure reliability, quiet operation, and many hours of productive life.

High Performance

Simple and efficient turbocharger with balance valve provides optimal air management and improved fuel efficiency.

Fuel Efficiency

Fuel consumption optimized to match operating cycles of a wide range of equipment and applications.

Fuel & Oil

Tier 4 Interim/Stage IIIB engines require Ultra Low Sulfur Diesel (ULSD) fuel containing a maximum of 15 ppm sulfur, and new oil formulations to support the new technology. Cat® engines are designed to accommodate B20 biofuel. Your Cat dealer can provide more information regarding fuel and oil.

Broad Application Range

Industry leading range of factory configurable ratings and options for agricultural, materials-handling, construction, mining, forestry, waste, and other industrial applications.

Package Size

Exceptional power density enables standardization across numerous applications. Multiple installation options minimize total package size.

Low-Cost Maintenance

Worldwide service delivers ease of maintenance and simplifies the servicing routine. Minimum 5000-hour diesel particulate filter ash service interval enables low-cost maintenance. Capable of optimal oil change intervals of up to 500 hours, depending on rating, application, operating conditions, and maintenance practices. The S·O·SSM program is available from your Cat dealer to determine oil change intervals and provide optimal performance.

Quality

Every Cat engine is manufactured to stringent standards in order to assure customer satisfaction.

World-class Product Support Offered Through Global Cat Dealer Network

- Scheduled maintenance, including S·O·SSM sample
- Customer Support Agreements (CSA)
- Cat Extended Service Coverage (ESC)
- Superior dealer service network
- Extended dealer service network through the Cat Industrial Service Distributor (ISD) program

Web Site: For additional information on all your power requirements, visit www.cat-industrial.com.



C9.3 ACERT™ Industrial Engine

Tier 4 Interim/Stage IIIB
224-261 kW (300-350 bhp) @ 1800-2200 rpm

STANDARD ENGINE EQUIPMENT

Air Inlet System

Turbocharged Air-to-Air Aftercooled

Control System

Electronic control system, over-foam wiring harness, automatic altitude compensation, power compensated for fuel temperature, configurable software features, engine monitoring system SAE J1939 broadcast and control, integrated Electronic Control Unit (ECU) remote fan control

Cooling System

Vertical outlet thermostat housing, centrifugal water pump, guidance on cooling system design available to ensure machine reliability

Exhaust System

Clean Emissions Module (CEM) that includes Diesel Particulate Filter (DPF), Diesel Oxidation Catalyst (DOC), and Cat Regeneration System, optional exhaust outlet

Flywheels and Flywheel Housing

SAE No. 1 and SAE No. 2 flywheel housings, dual rear PTO configuration

Fuel System

High pressure common rail, primary fuel filter, secondary fuel filters, fuel transfer pump, electronic fuel priming

Lube System

Open crankcase ventilation system, oil cooler, oil filler, oil filter, oil dipstick, oil pump (gear driven), choice of sumps (front, rear, and center)

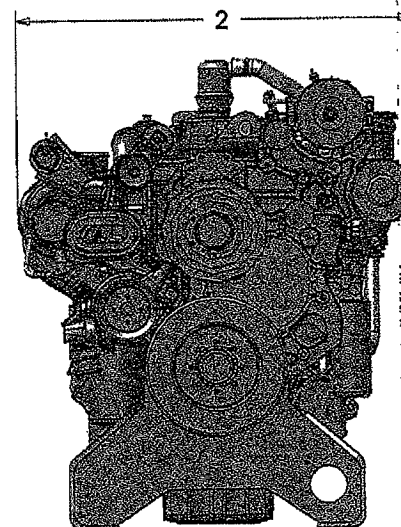
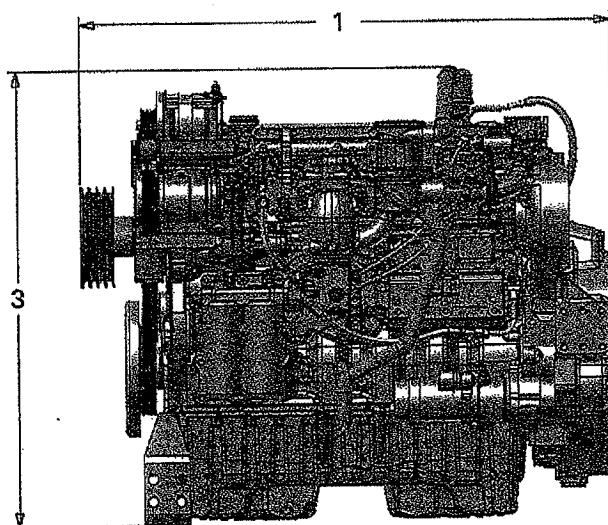
Power Take Off

SAE A, SAE B, and SAE C drives available, engine power can also be taken from the front of the engine on some applications

General

Paint: Cat yellow, vibration damper, lifting eyes

DIMENSIONS



(1) Length — 1150 mm (45.3 in) (2) Width — 827 mm (32.6 in) (3) Height — 1123 mm (44.21 in)

Note: Final dimensions dependent on selected options

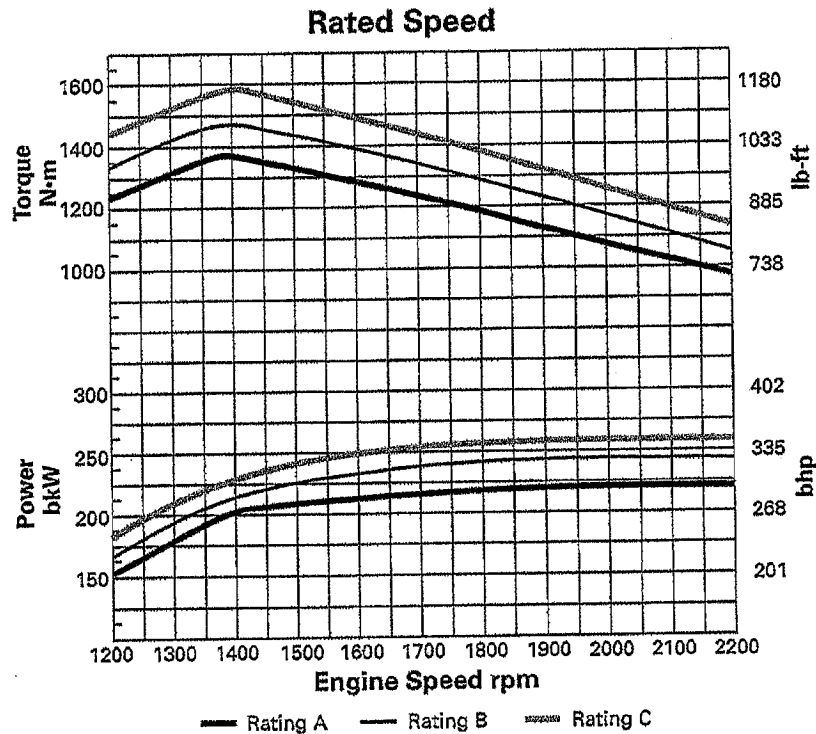


C9.3 ACERT™ Industrial Engine

Tier 4 Interim/Stage IIIB
224-261 bkW (300-350 bhp) @ 1800-2200 rpm

PERFORMANCE DATA — PRELIMINARY

Turbocharged-Aftercooled — 1800-2200 rpm



Speed Range

Rating	Speed rpm	Peak Power bkW	Peak Power bhp	Speed rpm	Peak Torque N-m	Peak Torque lb-ft
A	2200	224	300	1400	1369	1010
B	2200	242	325	1400	1483	1094
C	2200	261	350	1400	1597	1178

RATING DEFINITIONS AND CONDITIONS

IND-A (Continuous) for heavy duty service where the engine is operated at maximum power and speed up to 100% of the time without interruption or load cycling.

IND-B for service where power and/or speed are cyclic (time at full load not to exceed 80%).

IND-C (Intermittent) is the horsepower and speed capability of the engine where maximum power and/or speed are cyclic (time at full load not to exceed 50%).

Additional ratings are available for specific customer requirements. Consult your Cat dealer.

Rating Conditions are based on SAE J1995, inlet air standard conditions of 99 kPa (29.31 in Hg) dry barometer and 25°C (77°F) temperature. Performance measured using a standard fuel with fuel gravity of 35° API having a lower heating value of 42 780 kJ/kg (18,390 btu/lb) when used at 29°C (84.2°F) with a density of 838.9 g/L.

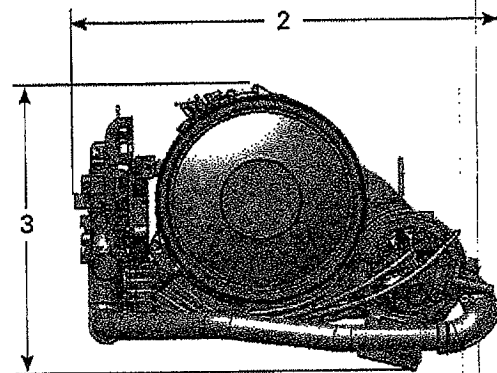
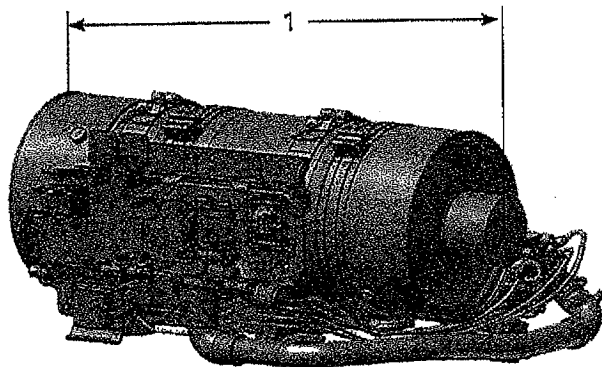


C9.3 ACERT™ Industrial Engine

Tier 4 Interim/Stage IIIB

224-261 kW (300-350 bhp) @ 1800-2200 rpm

AFTERTREATMENT CONFIGURATION



Images shown may not reflect actual aftertreatment.

304.8 mm (12 in) DIAMETER BASE CONFIGURATION SHOWN

Approximate Size and Weight

(1) Length — 925.89 mm (36.45 in)

(2) Width — 714.40 mm (28.12 in)

(3) Height — 392.21 mm (15.44 in)

Weight — 130 kg (287 lbs)

Multiple customizable configuration options available.

CEM Options

Base configuration includes DPF, DOC, and supporting structure

Standard configuration is also available, which includes DPF, DOC, muffler, and supporting structure. Contact your Cat dealer for additional information.

AFTERTREATMENT FEATURES

Regeneration: Cat Regeneration System maximizes fuel efficiency during regeneration

Flexibility: Flexible regen options maximize uptime

Flex pipe connection kit with 90° rotatable elbows to attach to Cat Regeneration System Inlet

Mounting: Remote installation options provide OEM flexibility for many applications, including horizontal and vertical mounting, with and without muffler

Service: Minimum 5000-hour diesel particulate filter ash service interval

Available in 12V or 24V systems

STANDARD EMISSIONS CONTROL EQUIPMENT

Cat Regeneration System

CEM: Clean Emissions Module


DOC: Diesel Oxidation Catalyst

DPF: Diesel Particulate Filter

NRS: NOx Reduction System

Materials and specifications are subject to change without notice. The International System of Units (SI) is used in this publication. CAT, CATERPILLAR, their respective logos, ACERT, S-O-S, "Caterpillar Yellow" and the "Power Edge" trade dress, as well as corporate and product identity used herein, are trademarks of Caterpillar and may not be used without permission.

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California Environmental Protection Agency  Air Resources Board	CATERPILLAR INC.	EXECUTIVE ORDER U-R-001-0484-1 New Off-Road Compression-Ignition Engines
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Pursuant to the authority vested in the Air Resources Board by Sections 43013, 43018, 43101, 43102, 43104 and 43105 of the Health and Safety Code; and

Pursuant to the authority vested in the undersigned by Sections 39515 and 39516 of the Health and Safety Code and Executive Order G-02-003;

IT IS ORDERED AND RESOLVED: That the following compression-ignition engines and emission control systems produced by the manufacturer are certified as described below for use in off-road equipment. Production engines shall be in all material respects the same as those for which certification is granted.

MODEL YEAR	ENGINE FAMILY	DISPLACEMENT (liters)	FUEL TYPE	USEFUL LIFE (hours)
2014	ECPXL09.3HPB	9.3	Diesel	8000
SPECIAL FEATURES & EMISSION CONTROL SYSTEMS			TYPICAL EQUIPMENT APPLICATION	
Electronic Direct Injection, Turbocharger, Charge Air Cooler, Oxidation Catalyst, Engine Control Module, Exhaust Gas Recirculation, Periodic Trap Oxidizer			Tractor, Loader, Motor Grader	

The engine models and codes are attached.

The following are the exhaust certification standards (STD), or family emission limit(s) (FEL) as applicable, and certification levels (CERT) for hydrocarbon (HC), oxides of nitrogen (NOx), or non-methane hydrocarbon plus oxides of nitrogen (NMHC+NOx), carbon monoxide (CO), and particulate matter (PM) in grams per kilowatt-hour (g/kw-hr), and the opacity-of-smoke certification standards and certification levels in percent (%) during acceleration (Accel), lugging (Lug), and the peak value from either mode (Peak) for this engine family (Title 13, California Code of Regulations, (13 CCR) Section 2423):

RATED POWER CLASS	EMISSION STANDARD CATEGORY		EXHAUST (g/kw-hr)					OPACITY (%)		
			HC	NOx	NMHC+NOx	CO	PM	ACCEL	LUG	PEAK
130 ≤ kW ≤ 560	Tier 4 Final/ALT 20% NOx	STD	0.19	0.40	N/A	3.5	0.02	N/A	N/A	N/A
		FEL	N/A	1.8	--	N/A	N/A	N/A	N/A	N/A
		CERT	0.06	1.6	--	0.2	0.004	--	--	--

BE IT FURTHER RESOLVED: That the family emission limit(s) (FEL) is an emission level declared by the manufacturer for use in any averaging, banking and trading program and in lieu of an emission standard for certification. It serves as the applicable emission standard for determining compliance of any engine within this engine family under 13 CCR Sections 2423 and 2427.

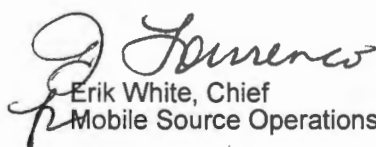
BE IT FURTHER RESOLVED: That for the listed engine models, the manufacturer has submitted the information and materials to demonstrate certification compliance with 13 CCR Section 2424 (emission control labels), and 13 CCR Sections 2425 and 2426 (emission control system warranty).

Engines certified under this Executive Order must conform to all applicable California emission regulations.

This Executive Order is only granted to the engine family and model-year listed above. Engines in this family that are produced for any other model-year are not covered by this Executive Order.

This Executive Order hereby cancels and replaces Executive Order U-R-001-0484 dated September 06, 2013.

Executed at El Monte, California on this 9th day of December 2013.


Erik White, Chief
Mobile Source Operations Division

Engine Model Summary Template

U-R-001-0484-1

4/24/2014

R/C

Engine Family	1.Engine Code	2.Engine Model	3.BHP@RPM (SAE Gross)		4.Fuel Rate: mm/stroke @ peak HP (for diesel only)		5.Fuel Rate: (lbs/hr) @ peak HP (for diesels only)		6.Torque @ RPM (SEA Gross)		7.Fuel Rate: mm/stroke@peak torque		8.Fuel Rate: (lbs/hr)/@peak torque		9.Emission Control Device Per SAE J1930
ECPXL09.3HPB	Cert Test 1	C9.3	361@1900		193		123		1252@1400		249		117		DFI,TC,ECM,CAC,EGR,PTO
ECPXL09.3HPB	Cert Test 2	C9.3	409@1900		226		144		1413@1400		305		144		DFI,TC,ECM,CAC,EGR,PTO
ECPXL09.3HPB	1 - 224/2100	C9.3	202@2150		111		80		853@1000		175		59		DFI,TC,ECM,CAC,EGR,PTO
ECPXL09.3HPB	2 - 244/2100	C9.3	220@2150		127		92		934@1000		175		59		DFI,TC,ECM,CAC,EGR,PTO
ECPXL09.3HPB	3 - 264/2100	C9.3	239@2150		133		96		1013@1000		183		62		DFI,TC,ECM,CAC,EGR,PTO
ECPXL09.3HPB	4 - 284/2100	C9.3	256@2150		138		100		1094@1000		228		77		DFI,TC,ECM,CAC,EGR,PTO
ECPXL09.3HPB	5 - 316/1800	C9.3	272@1880		164		104		1049@1600		208		105		DFI,TC,ECM,CAC,EGR,PTO
ECPXL09.3HPB	5A - 316/1800	C9.3	272@1880		164		104		1049@1600		208		105		DFI,TC,ECM,CAC,EGR,PTO
ECPXL09.3HPB	6 - 316/1800	C9.3	272@1880		164		104		1049@1600		203		102		DFI,TC,ECM,CAC,EGR,PTO
ECPXL09.3HPB	6A - 316/1800	C9.3	272@1880		164		104		1049@1600		203		102		DFI,TC,ECM,CAC,EGR,PTO
ECPXL09.3HPB	7 - 249/1300	C9.3	162@2080		93		65		994@1300		192		89		DFI,TC,ECM,CAC,EGR,PTO
ECPXL09.3HPB	8 - 326/1700	C9.3	239@2300		134		103		1047@1600		208		112		DFI,TC,ECM,CAC,EGR,PTO
ECPXL09.3HPB	9 - 326/1700	C9.3	239@2300		134		103		1047@1600		208		112		DFI,TC,ECM,CAC,EGR,PTO
ECPXL09.3HPB	10 - 224/2100	C9.3	202@2150		111		80		853@1000		175		59		DFI,TC,ECM,CAC,EGR,PTO
ECPXL09.3HPB	11 - 244/2100	C9.3	220@2150		127		92		934@1000		175		59		DFI,TC,ECM,CAC,EGR,PTO
ECPXL09.3HPB	12 - 249/1300	C9.3	162@2080		93		65		994@1300		192		89		DFI,TC,ECM,CAC,EGR,PTO

Edge TS 80 Tracked Stacker & Engine

TS80-40 / TS80-48 Technical Specification

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GENERAL TECHNICAL DATA

OPERATION MODE

- Machine Width..... 2294mm / 7ft 6ins
- Machine Length.....24.3m / 80ft
- Maximum Discharge Height:..... 11024mm / 36ft 2ins
- Working Angle: 0-28 degrees

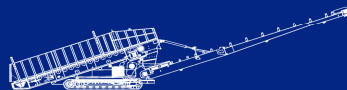
TRANSPORT MODE

- Transport Width..... 2294mm / 7ft 6ins
- Transport Length..... 12574mm / 41ft 3ins.
- Transport Height..... 2433mm / 8ft

WEIGHTS

- Standard Machine.....11800 kg / 13 US Tons
- Dual Power Machine..... 13760 kg / 15.1 US Tons

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MAIN CONVEYOR

- TS80 - 40 Belt Width.....1000mm / 40 ins
- TS80 - 48 Belt Width1220mm / 48 ins
- Belt Length..... 24.384m / 80ft
- Belt Type..... EP 500 3PLY / Optional
- Drum Centres:..... 23104
- Drive drum: 296
- Tail drum: 274

POWERUNIT

- EngineDiesel Hydraulic
- Engine Type.....CAT 2.2NA / Developing 38kw / 50bhp @ 2200 Rpm
- Fuel ConsumptionFuel Consumption 5.2-6.2ltr/hr
- Fuel tank volume.....216 Litres

HYDRAULICS:

- Hydraulic motor standard machine.....Danfoss OMV630 / 1 off
- Hydraulic motors, twin drive machine.....Danfoss OMV630 / 2 off

TRACK DATA:

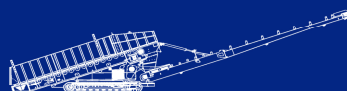
- Track length.....3.5m
- Track Shoe Width.....400
- Trackive Effort14300 daN
- Gearbox Ratio.....134:1
- Hydraulic Motor.....Rexroth 32cc / Rev
- Approx Speed.....1.6 km /hr (0.95 Mph)



ADVANTAGES:

- Easily Tracked in and out of a 40 ft container minimising transport costs.
- Can be used for a variety of applications including: Crushed Aggregate, Top Soil, Bark, Coal, Sand and Fines.
- Has a range of Input and Output Heights and can be used in conjunction with any crusher or screener.
- Greater operating efficiency
- Stockpile capacity increased
- Easy to move around site
- Operating fuel costs reduced up to 75%-shovel operator not required to continuously move material from under conveyor.

TS80 Page 2/4



EDGE ARE GLOBAL LEADERS IN THE DESIGN INDUSTRY - MATERIALS RECYCLING - AGGREGATE PROCESSING - MINERALS HANDLING

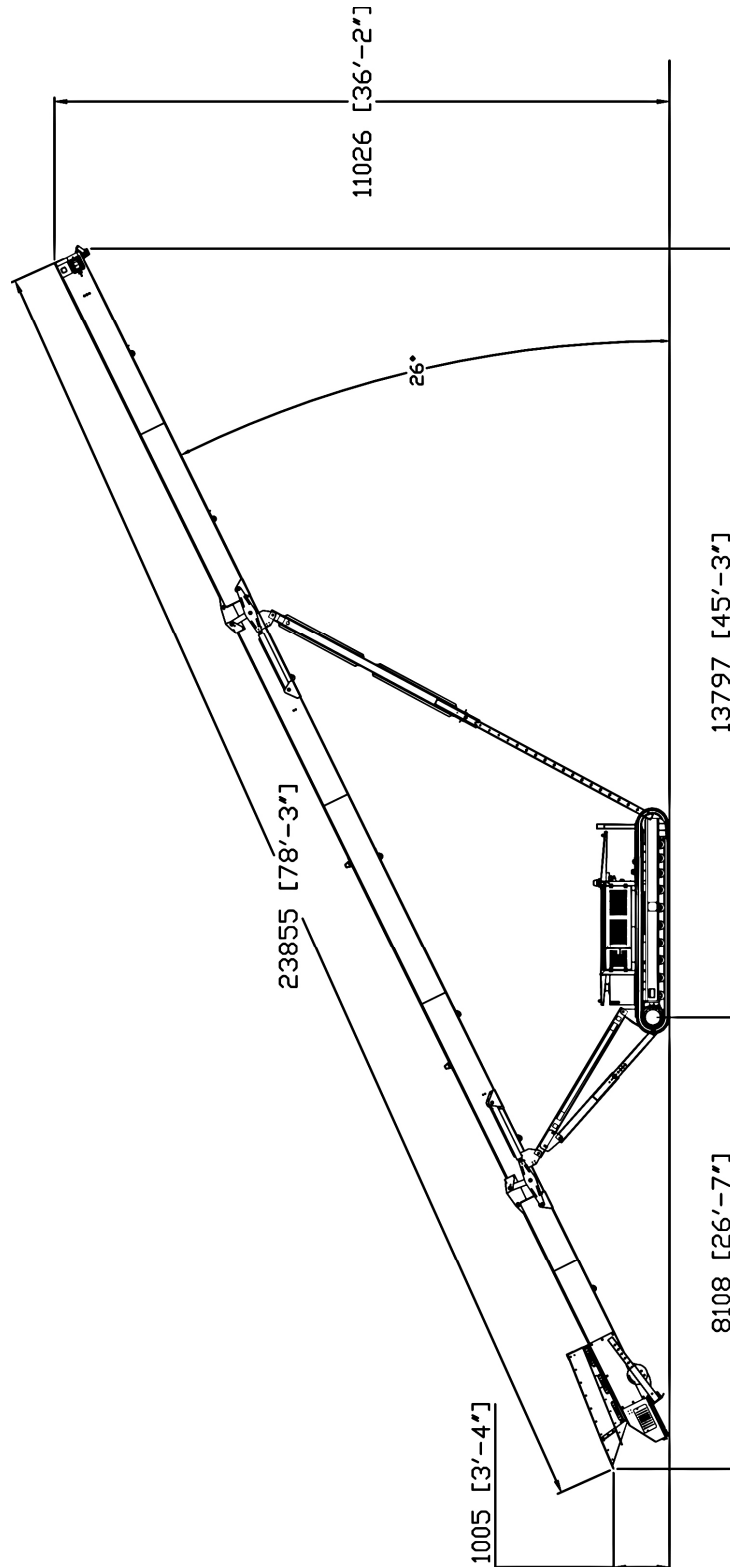
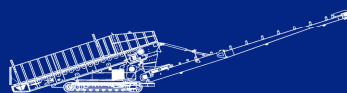


Fig. 1. TS80 Working Dimensions



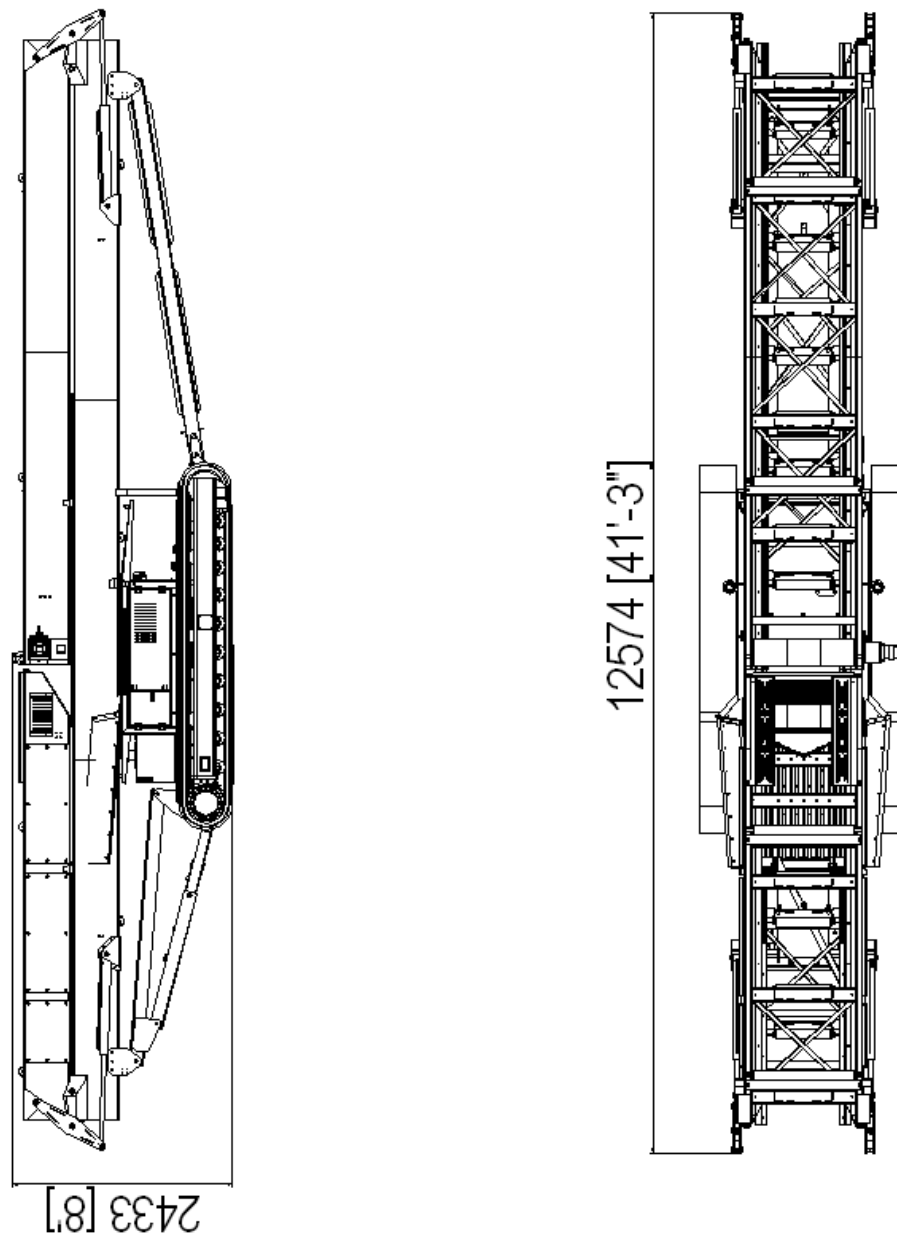


Fig. 2. TS80 Transit Dimensions



C2.2 Industrial Engine

Tier 4 Final

31.4-36.4 kW/42.1-48.8 bhp @ 2400-3000 rpm



CAT® ENGINE SPECIFICATIONS

I-4, 4-Stroke-Cycle Diesel

Bore	84 mm (3.3 in)
Stroke	100 mm (3.9 in)
Displacement	2.216 L (135 in ³)
Aspiration	Naturally Aspirated
Compression Ratio	23.3:1
Combustion System	Indirect Injection
Rotation (from flywheel end) ...	Counterclockwise
Capacity for Liquids	
Cooling System (engine only) ..	3.6 L (3.8 U.S. qts)
Lube Oil System (refill)	10.6 L (11.2 U.S. qts)
Engine Weight, Net Dry (approx)	
with standard equipment	218 kg (480.6 lb)

FEATURES

Emissions

Meets 2013 U.S. EPA Tier 4 Final emission standards.

Reliable, Quiet and Durable Power

World-class manufacturing capability and processes coupled with proven core engine designs assure reliability, quiet operation, and many hours of productive life.

High Performance

Substantial torque rise delivers impressive performance through a wide speed range while maintaining low operating costs

Fuel Efficiency

Fuel consumption optimized to match operating cycles of a wide range of equipment and applications.

Broad Application Range

Industry-leading range of factory configurable ratings and options for agricultural, materials-handling, construction, mining, aircraft ground support, and other industrial applications.

Package Size

Ultra-compact package size ensures ease of installation as well as exceptional power density.

Low-Cost Maintenance

Single-side servicing improves ease of maintenance and simplifies the servicing routine. Service intervals at 500 hours are standard.

Testing

Every Cat® engine is quality tested to ensure proper engine performance.

World-class Product Support Offered Through Global Cat Dealer Network

- Scheduled maintenance
- Customer Support Agreements (CSA)
- Caterpillar Extended Service Coverage (ESC)
- Superior dealer service network
- Extended dealer service network through the Cat Industrial Service Distributor (ISD) program

Web Site: For additional information on all your power requirements, visit www.cat-industrial.com.

STANDARD EQUIPMENT

Air Inlet

Inlet manifold with choice of inlets

Control System

Alternator 12V 85A, starter motor 12V, glow plug starting aid

Cooling System

Belt-driven coolant pump, coolant temperature switch, choice of cooling fans

Flywheel & Flywheel Housing

SAE No. 7-1/2, SAE No. 8, or SAE No. 10 flywheel, choice of SAE No. 4 or standard backplate flywheel housing

Fuel System

Simple, robust indirect injection fuel pump, spin-on fuel filter

Lube System

Alternative oil fillers, spin-on lube oil filter, lube oil pressure switch, lube oil sump

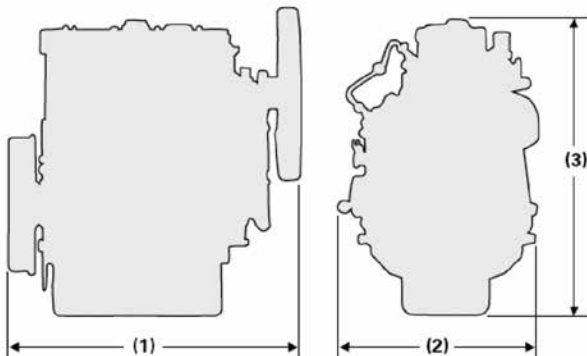
Power Take-Off

SAE A PTO drive

General

Cast iron engine block, cast iron exhaust manifold – side outlet, cold start capability to -20°C (-4°F), gradeability 35° continuous

DIMENSIONS



(1) Length	727 mm (28.6 in)
(2) Width	596 mm (23.5 in)
(3) Height	758 mm (29.9 in)

Note: Dimensions depend on final specifications.

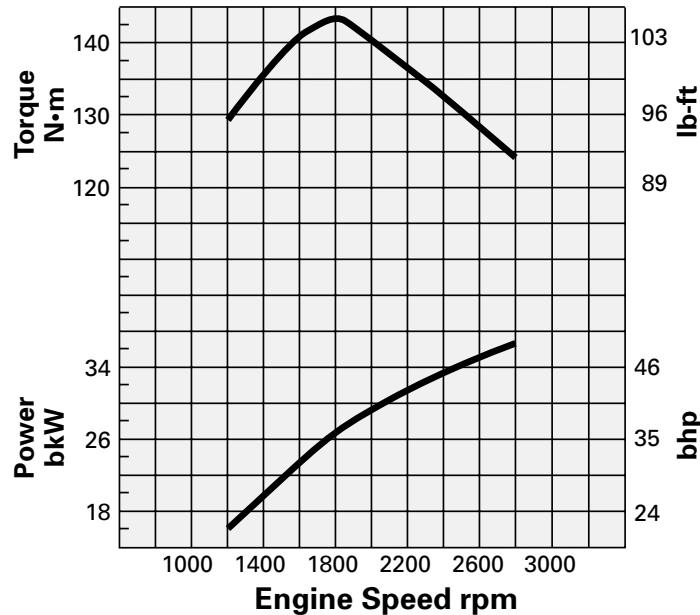


C2.2 Industrial Engine Tier 4 Final

31.4-36.4 bkW/42.1-48.8 bhp @ 2400-3000 rpm

PERFORMANCE DATA — PRELIMINARY

Naturally Aspirated — 2400-3000 rpm



Rating	Speed rpm	Peak Power bkW	Peak Power bhp	Speed rpm	Peak Torque N·m	Peak Torque lb-ft
C	2800	36.4	48.8	1800	143.0	105.5

RATING DEFINITIONS AND CONDITIONS

IND-C (Intermittent) is the horsepower and speed capability of the engine where maximum power and/or speed are cyclic (time at full load not to exceed 50%).

Additional ratings are available for specific customer requirements. Consult your Cat dealer.

Rating Conditions for Diesel Engines — up to 7.1 liter are based on ISO/TR14396, inlet air standard conditions with a total barometric pressure of 100 kPa (29.5 in Hg), with a vapor pressure of 1 kPa (.295 in Hg), and 25°C (77°F). Performance is measured using fuel to specification U.S. EPA 2D 89.330-96 with a density of 0.845-0.850 kg/L @ 15°C (59°F) and fuel inlet temperature 40°C (104°F).

AFTERTREATMENT CONFIGURATION

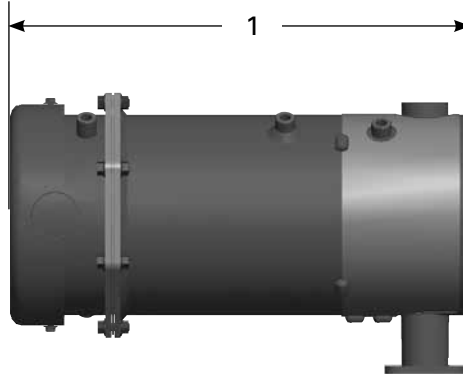


Image shown may not reflect actual aftertreatment.

198 mm (7.8 in) Diameter Base Configuration

Approximate Size and Weight

(1) Length — 449 mm (17.6 in)

Weight — 16 kg (35.3 lbs)

Note: Final weight and dimensions will depend on completed specification.

AFTERTREATMENT FEATURES

Regeneration:

Highly effective passive regeneration under most operating environments and cycles. Automatic, transparent active regeneration back up system during light load or adverse operating cycles. Wall flow DPF and through-flow DOC to effectively remove and manage emissions.

Mounting: Multiple off- and on-engine installation options provide customers with simple and flexible solutions for many applications.

Service: Minimum 3,000 hour DPF ash service intervals.

STANDARD EMISSIONS CONTROL EQUIPMENT

DPF: Diesel Particulate Filter with range of outlet options

DOC: Diesel Oxidation Catalyst