



BUREAU OF WASTE MANAGEMENT

DIVISION OF MUNICIPAL and RESIDUAL WASTE

GENERAL PERMIT WMGM065

PROCESSING, BY DRYING AND GASIFICATION, AND
BENEFICIAL USE OF SEWAGE SLUDGE, AGRICULTURAL
WASTE, FOOD WASTE AND WOOD WASTE AS A SOIL
AMENDMENT, AS AN INGREDIENT IN CONCRETE, AS A
REMEDIATION/TREATMENT MEDIUM OR AS A FUEL PRODUCT

Issued: March 8, 2021

Expires: March 8, 2031

Amended: January 23, 2026

DRYING AND GASIFICATION OF SEWAGE SLUDGE, AGRICULTURAL WASTES, FOOD WASTES AND OTHER WASTE STREAMS

A. Description:

This general permit authorizes the storage and processing of dewatered municipal wastewater sewage sludge from municipal wastewater treatment plants; animal manure/poultry litter; agricultural bird mortality waste (i.e. spent hens); animal mortality compost; unpackaged food waste from municipal or residual waste sources; food processing residuals and sludges; digestate; fats, oils and greases (FOG); spent mushroom substrate; crop waste; perennial grasses; compost; yard waste; and unfinished, uncontaminated clean wood waste for beneficial use as a soil amendment, as an ingredient in concrete, as a remediation/treatment medium, or as a fuel at power plants, cement kilns or other Department of Environmental Protection (DEP) approved combustions units. Processing is limited to drying and gasification. For the purpose of this permit, digestate refers to the solids remaining after anaerobic digestion. Additionally, for digestate to be accepted for processing under the terms and conditions of this permit, it shall only be derived from waste streams that would otherwise be authorized for processing under this permit without first being digested. Any waste material, subsequent to gasification, will hereinafter be referred to as "biochar."

B. Determination of Applicability Requirements:

A person or municipality that proposes to operate under the terms and conditions of this general permit after the date of permit issuance must obtain a "Determination of Applicability" ("DOA") from the appropriate DEP Regional Office (see attached list) prior to commencing authorized activities under this general permit. A completed application on forms provided by DEP along with the application fee for a DOA must be submitted to the appropriate DEP Regional Office. Checks shall be made payable to the "Commonwealth of Pennsylvania". No activities shall commence unless approved, in writing, by DEP.

C. Operating Conditions:

1. The facility may not process more than 700 wet tons of waste material per day.
2. The maximum volume of unprocessed waste, waste engaged in processing, and biochar cannot exceed 1,400 tons at the facility at any one time.
3. Sewage sludge received by the facility must comply with requirements to significantly reduce pathogens or requirements to further reduce pathogens set forth in 25 Pa. Code, Chapter 271, Subchapter J, Appendix A, unless the Department approves another method based upon demonstration that the method will control pathogens, vectors and odors.
4. The biochar may be beneficially used as a fuel if it has an as-fired thermal heat value of at least 5,000 BTU/lb. The 5,000 BTU/lb. threshold applies to the

thermal heat value of the fuel product prior to blending with other fuels, such as coal.

5. If biochar is being beneficially used as a fuel product, sampling and analysis shall be performed on the fuel product to ensure the BTU value of the fuel product is met. Weekly grab samples shall be composited into a monthly sample and sent to a laboratory for analysis. The Department may reduce the frequency of sampling and analysis required in this condition to no less frequently than annually after the fuel product has been monitored for 1 year and upon written request for less frequent sampling and analysis from the permittee. Sampling and analysis for BTU value is not necessary for biochar beneficially used in means other than as an alternative fuel.
6. The permittee must provide documentation to the Department that the fuel product contains contaminants at concentrations less than or equal to concentrations of the same contaminants in the traditional fuels which the combustion unit is designed to burn. A direct comparison of the contaminant levels in the fuel product to the traditional fuel must be performed, prior to sending fuel to each new user, to make this demonstration.
7. The beneficial use of the biochar as a soil amendment is contingent upon compliance with this permit and, if sold, the *Pennsylvania Fertilizer, Soil Conditioner and Plant Growth Substance Law* of the Pennsylvania Department of Agriculture. (Information relating to this law may be obtained from the Department of Agriculture by writing the *Bureau of Plant Industry, Division of Agronomic Services, 230 North Cameron Street, Harrisburg, PA 17110-9408.*)
8. The beneficial use of the biochar as a remediation/treatment medium is contingent upon approval or acknowledgement of the use of the biochar as a remediation or treatment media by a state or federal agency overseeing the remediation/treatment process.
9. If biochar is provided by the permittee for beneficial use as an ingredient in concrete, the permittee shall ensure that the biochar is used in concrete. This can be demonstrated by including language in a sales agreement to this effect or use another mechanism approved by the Department.
10. For biochar that is to be beneficially used other than as a fuel product, the permittee shall collect representative samples of the biochar and determine its quality before it may be beneficially used. Samples shall be collected and analyzed as follows:
 - a. The permittee shall determine that all samples of biochar comply with the applicable column of Table 1, in accordance with the procedure identified in this condition prior to beneficial use.

Table 1

PARAMETER	Concrete/ Asphalt	Soil Amendment/ Remediation material		Remediation material placed within 4ft of GW	
	Total (mg/kg)	Total (mg/kg)	Leachable (mg/L)	Total (mg/kg)	Leachable (mg/L)
ANTIMONY	88	88	0.15	88	0.006
ARSENIC	41	41	0.25	41	0.05
BARIUM	15,000	15,000	50	15,000	2
BERYLLIUM	440	440	0.1	440	0.004
CADMIUM	39	39	0.125	39	0.005
CHROMIUM	94	94	2.5	94	0.1
COPPER	1,500	1,500	32.5	1,500	1
CYANIDE, FREE	4,400	4,400	5	4,400	0.2
LEAD	300	300	0.25	300	0.015
MERCURY	17	17	0.05	17	0.002
MOLYBDENUM	18	18	4.375	18	0.175
NICKEL	420	420	2.5	420	0.1
SELENIUM	100	100	1.25	100	0.05
THALLIUM	15	15	0.05	15	0.002
ZINC	2,800	2,800	50	2,800	2
PCBs	4	4	0.0125	4	0.0005
Total VOC*	---	---	---	---	---

*Total VOC does not have a limit. If VOC's are detected at a level that would have the potential to exceed organics parameters, additional analysis may be needed.

- b. At initial process startup and prior to the first beneficial use of any biochar under the provisions of the permit, the permittee shall collect a representative sample of the first, and each subsequent, 100 tons of biochar and analyze for each parameter listed in Table 1, and physical properties consistent with construction application specifications and end use by utilizing ASTM test methods and/or DOT specifications.
- c. To obtain a representative sample of the biochar, samples must be taken from multiple locations in the batch and represent the entire amount of biochar being sampled. In the batch process, more than one sample is necessary to accurately represent a particular batch. In general, the more samples taken, the greater the chance that the sampling results will be representative. The pollutant limits specified in Table 1 pertain to the quality of biochar that will be beneficially used, and therefore, samples must be collected after the final stage of processing and prior to storage of the produced biochar. Should knowledge of the incoming waste streams, processing operation, visual observations, or analytical results indicate

variability in the quality of the material, more frequent testing shall be conducted.

- d. The permittee may beneficially use biochar upon receipt of results indicating compliance with Condition C.10.a. above.
- e. The permittee may request a reduction in the required frequency of sampling/testing by submitting a written request to the appropriate Department regional office (see attached list) if the following criteria are met:
 - i. Five consecutive 100-ton sampling events have been conducted in accordance with subparagraph ii., above; and the analyses from the sampling events show that the limits specified in Table 1 of this condition have been satisfied; or the permittee may also request that individual constituents be eliminated from the testing requirement if after five consecutive 100-ton sampling events, the results show that the constituent(s) is not detected in the analytical results. Any reduction in sampling/analysis frequency or elimination of constituents would apply to biochar generated from the same waste streams from which the reduction was justified. Changes in incoming waste streams or variation in mix ratios could invalidate any relaxation of sampling/analysis requirements.
 - ii. Written approval from the Department must be obtained prior to implementing a reduced analyte list or sampling/testing frequency.

11. The facility shall not be located:

- a. In the 100-year floodplain of waters of this Commonwealth, unless the Department approves in the permit a method of protecting the facility from a 100-year flood consistent with the Flood Plain Management Act (32 P.S. §§679.101 - 679.601) and the Dam Safety and Encroachment Act (32 P.S. §§693.1 – 693.270);
- b. In or within 300 feet of an exceptional value wetland;
- c. In or within 100 feet of a wetland other than an exceptional value wetland;
- d. Within 100 feet of a sinkhole or area draining into a sinkhole;
- e. Within 900 feet measured horizontally from an occupied dwelling unless the owner of the dwelling has provided a written waiver consenting to the facility being closer than 900 feet;
- f. Within 50 feet of a property line unless the owner has provided a written waiver consenting to the facility being closer than 50 feet;
- g. Within 100 feet of a perennial stream;
- h. Within 300 feet of a water source unless the owner has provided a written waiver consenting to the facility being closer than 300 feet;

- i. Within 3.3 feet of the regional groundwater table;
- j. Within 900 feet of the following, if existing prior to the date the Department received an administratively complete application, unless a written waiver is obtained from the current property owner of:
 - i. A building owned by a school district or parochial school and used for instructional purposes;
 - ii. A park;
 - iii. A playground.
- k. In an area where the facility would adversely affect a habitat of a known endangered or threatened species

12. Upon cessation of permitted operations at the facility, the permittee shall ensure removal of all wastes and provide for the processing, recycling, beneficial use, or disposal of wastes in accordance with the SWMA, the environmental protection acts and the regulations promulgated thereunder.

13. The activities authorized by this permit shall not cause or allow conditions that are harmful to the environment, public health or safety, including but not limited to, odors, noise, or other public nuisances. The permittee shall not cause or allow the attraction, harborage, or breeding of vectors. Storage of the biochar shall be covered to prevent dispersal by wind or water erosion and in a manner that prevents fire or explosion. The biochar must be stored within an enclosed unit, and not in a manner that causes ground or surface water contamination. In addition, biochar should be stored in a manner that prevents absorption of contaminants from the environment prior to beneficial use.

14. The local police, fire department, or other appropriate state or local emergency response agencies shall be contacted immediately in the event of a fire, spill, or other hazard arising from operation of the facility that threatens public health, safety, and welfare, or the environment, and whenever necessary in the event of personal injury related to such storage.

15. The permittee shall develop and implement a Preparedness, Prevention and Contingency (PPC) Plan that is consistent with the Department's most recent guidelines.

16. The operator of the facility must develop and maintain a plan for the alternative management of materials during periods when the facility is not producing biochar. If the facility is out-of-service for a longer period of time than the storage capacity of the site will allow, the solid waste shall be removed from the site.

17. The permittee must implement and maintain a plan and procedure for identifying and rejecting unacceptable loads at the processing facility.
18. Wastes, other than the wastes specified in the description of this general permit, may not be received, mixed, processed, stored, or beneficially used with the wastes intended for beneficial use. In addition, wastes generated from animal disease outbreaks or non-routine agricultural depopulation events shall not be accepted for processing or beneficial use without obtaining written approval from DEP prior to acceptance.
19. This permit does not authorize the acceptance of hazardous waste, as the term is defined in 25 Pa. Code, § 261a.1.
20. All activities conducted under the authorization granted in this permit shall be conducted in accordance with the permittee's application. Except to the extent the permit states otherwise, the permittee shall utilize materials as described in the permit application.
21. The permittee shall comply with the fugitive emissions regulations under 25 Pa. Code, Chapter 123 (relating to standards for contaminants) issued under the Air Pollution Control Act, the Act of January 8, 1960, P.L. 2119, 35 P.S. §4005, and shall comply with all the applicable provisions of 25 Pa. Code §§123.1 and 123.2 (relating to prohibition of certain fugitive emissions and fugitive particulate matter).
22. Nothing in this permit shall be construed to supersede, amend, or authorize a violation of any of the provisions of any valid and applicable local law, ordinance, or regulation, providing that said local law, ordinance, or regulation is not preempted by the Solid Waste Management Act (SWMA), 35 P.S. §§ 6018.101—6018.1001; and the Municipal Waste Planning, Recycling and Waste Reduction Act of 1988, 53 P.S. §§4000.101, et seq.
23. As a condition of this general permit and of the permittee's authority to conduct the activities authorized by this general permit, the permittee hereby authorizes and consents to allow authorized employees or agents of the Department, without advance notice or search warrant, upon presentation of appropriate credentials and without delay, to have access to and inspect all areas on which solid waste management activities are being, will be, or have been conducted. This authorization and consent shall include consent to collect samples of waste, soils, water, or gases; take photographs; perform measurements, surveys, and other tests; inspect any monitoring equipment; inspect the methods of operation and inspect and/or copy documents, books, and papers required by the Department to be maintained. This permit condition is referenced in accordance with Sections 6018.608 and 6018.610(7) of the SWMA, 35 P.S. §§ 6018.608 and 6018.610(7). This condition in no way limits any other powers granted under the SWMA.

24. Any independent contractors or agents retained by the permittee in the completion of activities authorized under this general permit shall be subject to compliance history review by the Department prior to performance of any activities, as specified by the SWMA.
25. Failure of measures herein approved to perform as intended, or as designed, or in compliance with the applicable laws, rules, and regulations and terms and conditions of this permit, for any reason, shall be grounds for the revocation or suspension of the permittee's approval to operate under this permit.
26. The activities authorized by this general permit shall not harm or present a threat of harm to the health, safety, or welfare of the people or environment of this Commonwealth. The Department may modify, suspend, revoke, and reissue the authorization granted in this general permit if it deems necessary to prevent harm or the threat of harm to the public health, and the environment or if they cannot be adequately regulated under the conditions of this general permit.
27. The permittee shall comply with the terms and conditions of this general permit and with the environmental protection acts to the same extent as if the activities were covered by an individual permit. The Department may require an individual permit be obtained if the permittee cannot comply with the conditions of this general permit or is conducting an activity that harms or presents a threat of harm to the health, safety, or welfare of the public or the environment of this Commonwealth.
28. This permit does not authorize and shall not be construed as an approval to discharge any waste, wastewater, or runoff from the site of processing to the land or waters of the Commonwealth.
29. Best Management Practices shall be implemented to divert storm water run-on from the storage area. Storm water runoff shall be managed in accordance with The Clean Streams Law and regulations promulgated thereunder. Prior to beginning operations at the facility, the operator must obtain all necessary storm water management permits.
30. The permittee shall maintain in force and affect a general liability insurance policy in accordance with 25 Pa. Code, Chapter 271, Subchapter D (relating to financial assurances requirements) to provide continuous coverage during operation of the facility and until the Department issues a final closure certification.
31. The permittee shall maintain a bond in an amount and with sufficient guarantees as provided by 25 Pa. Code, Chapter 271, Subchapter D (relating to Financial Assurances Requirements).
32. Unless specifically approved by the Department in writing, the biochar shall not be stored for more than one (1) year, and as follows:

- a. The biochar is not accumulated before being beneficially used unless the operator shows that the soil amendment is potentially reusable and has a feasible means of being beneficially used; and
- b. During the calendar year (commencing on January 1), the biochar that is beneficially used, equals at least 75% by weight or volume of the biochar accumulated at the beginning of the period.

33. Equipment used for the storage of incoming waste and biochar shall be maintained in good operating condition. Daily inspections of each storage area and surrounding environs shall be conducted to determine compliance of the terms and conditions of this general permit and for evidence of failure.

34. The waste receiving and processing areas must be located within an enclosed structure(s).

35. The biochar must be stored within an enclosed unit.

36. Storage of incoming wastes, and biochar by the permittee shall be in a manner that complies with the requirements set forth in 25 Pa. Code, Chapter 285 (relating to storage, collection and transportation of municipal waste).

37. Leachate generated and stored at the facility shall be stored in a tank or container designed in accordance with 25 Pa. Code, Chapter 285 (relating to storage and transportation of municipal waste) prior to being reused on-site, discharged to a Publicly Owned Treatment Works (POTW) or transported off-site for treatment and/or disposal. Leachate reuse on-site is limited to being used as part of the biochar manufacturing process.

38. The incoming wastes and biochar shall not be mixed with other types of solid wastes, including hazardous waste, municipal waste, special handling waste, or other residual waste, as the terms are defined in 25 Pa. Code § 271.1.

39. When used as a soil amendment, the biochar shall not be placed in direct contact with surface water or groundwater of the Commonwealth.

40. When used as a soil amendment, the biochar shall not be placed within 300 feet of an exceptional value wetland and or within 300 feet of a private or public water source, unless waived, in writing by the private or public water source.

41. When used as soil amendment, the biochar shall not be used as a valley fill material, to fill open pits from coal or non-coal mining; or to level or bring an area to grade.

42. Runoff from the biochar storage area(s) shall not cause surface water pollution or groundwater degradation and shall be managed in accordance with The Clean Streams Law and regulations promulgated thereunder.

43. Analytical testing required by this general permit shall be performed by a laboratory accredited under the Pennsylvania Environmental Laboratory Accreditation Act, Act of 2002, 27 Pa. C.S.A. §§ 4101-4113.

D. Recordkeeping:

1. The permittee shall maintain records of all analytical evaluations conducted in accordance with this permit, and records shall be made available to the Department upon request. Required records shall be retained for a minimum of 5 years. Records of analytical evaluations must include, at a minimum, the following for each sample: the source(s) of wastes in the sample being analyzed, the dates of sampling and testing, sampling procedures utilized, name of the individual who collected the sample, the volume or weight of the sample, each parameter tested, the analytical results, the name of the analytical laboratory used, and the analytical methodologies employed.
2. The permittee shall maintain records of all waste accepted by the facility, and records shall be made available to the Department upon request. Required records shall be retained for a minimum of 5 years. Records of each source of incoming waste must include, at a minimum, the following: the name, address, and phone number of each source of incoming waste; the date of receipt; the quantity of waste received; the results of visual observations; and the name, address, and phone number of the destination of each outgoing shipment of waste. The permittee shall also maintain records of spills or releases that include, at a minimum, the following: the location, date, time, identification, and quantity of spilled or released material, and a description of how the material was cleaned up. The permittee shall also maintain records of all reports submitted to the Department or to the U.S. Environmental Protection Agency.
3. The permittee shall maintain records of the quantity of each outgoing shipment of biochar for beneficial use, the type of beneficial use and the name, address and phone number for each destination. Records shall be made available to the Department upon request. Required records shall be retained for a minimum of 5 years.
4. The permittee shall maintain training records that contain the following: employees who received training, date training occurred, and instructor. Records shall be retained by the permittee at the permittee's place of business for a minimum of 5 years from the date the records were generated and available for review at the Department's request.
5. Demonstrate that each biochar produced for beneficial use meets the concentration limits listed in Table 1 of Condition 10 in this general permit
6. Records of rejected, unacceptable and unauthorized wastes that are disposed of from the facility. The records shall include the name and address of the permitted disposal location, date of disposal, volume or weight of the waste that is disposed.

E. Reporting Requirements:

1. All new sources of sewage sludge must be processed and beneficially used in accordance with terms and conditions of this general permit, the permittee's application, and in compliance with the environmental protection acts. If new sources of sewage sludge are to be received by the permittee for processing and beneficial use, the permittee shall electronically submit the following information to the appropriate Department Regional Office, via the Form 43, for review and approval prior to acceptance by the permittee:
 - a. Certification that the sewage sludge is not a hazardous waste, as defined by 40 CFR Part §261. Certification shall include analytical data from one or more representative sample(s), collected within the prior 12 months of the sewage sludge material, collected and managed in accordance with EPA's Hazardous Waste Test Methods in Publication No. SW-846, that is analyzed by a laboratory accredited under the Pennsylvania Environmental Laboratory Accreditation Act, Act of 2002, 27 Pa. C.S.A. §§ 4101-4113. A sufficient number of analyses to demonstrate the consistency of the analytical results shall be provided;
 - b. The name, address, and location of the sewage sludge generator or other waste generator for wastes received, as well as the volume of sewage sludge and weight of other wastes that the permittee anticipates receiving from the generator; and
 - c. Documentation that the new source of sewage sludge complies with the conditions of the general permit, the permittee's application, and can be received by the permittee for processing prior to beneficial use.

Permittees may commence with receipt of the new source after fifteen (15) business days from the date the Department receives the written request unless otherwise notified by the Department. During the determination of accepting sewage sludge from a new source, the permittee shall consider the processing and beneficial use of the new source of sewage sludge in accordance with all permit conditions in this general permit. If it is determined after the fifteen (15) business day period that the new source material was not consistent with the conditions of this general permit, the permittee shall be subject to any and all applicable enforcement actions of the Solid Waste Management Act or the Department's rules and regulations promulgated thereunder. The absence of an action by the Department during or after the fifteen-business day timeframe does not constitute an approval or final action of the Department. New source

submittals found to be deficient during Department review must be addressed to the satisfaction of the Department prior to acceptance by the permittee.

2. The permittee is not authorized to accept sewage sludge for new sources if the generator is unable to provide the required information in Condition E.1.
3. Any person that operates under the provisions of this permit shall immediately notify the Department via certified mail of any changes in: the company name, address, owners, operators, and/or responsible officials of the company, compliance status, the generator of the solid waste the physical and chemical characteristics of the biochar and the status of any permit issued by the Department or federal government under the environmental protection acts.
4. Persons operating under the provision of this general permit shall submit to the appropriate Department Regional Office (see attached list), an annual report on the beneficial use activities conducted under this permit by March 1 for the preceding calendar year. This report shall include the records required to be maintained in accordance with Conditions D.1.-D.6., and, if applicable, updated bonding calculations in accordance with 25 Pa. Code, Chapter 271, Subchapter D.
5. The permittee shall immediately notify the Department's Emergency Hotline by telephone at 800-541-2050 and the appropriate DEP regional staff in the event of a discharge or spill of waste or biochar and shall take appropriate action to protect the health and safety of the public and the environment.

F. Renewal:

A generator or supplier that plans to continue the operations authorized under this general permit, after the expiration date indicated on the approval for coverage page, shall file a complete application for permit renewal at least 180 days before the expiration date of this general permit unless permission has been granted by the Department for submission at a later date. The renewal applications shall be submitted to the appropriate DEP Regional Office (see attached list) and include, at a minimum, the following:

1. General Information Form (Authorization Application for a Residual or Municipal Waste General Permit Application),
2. Form B (Professional Certification),
3. Form 20 (Application for a Municipal or Residual Waste General Permit),
4. Form E-GP,
5. Form MRW-C,

6. Form 27M (Acceptance of General Permit Conditions), and
7. Updated Bonding Worksheets.

Additionally, a renewal application fee in the amount identified in Section A (General Information) of the Form 20 must be sent to the appropriate DEP Regional Office. A check shall be made payable to the Commonwealth of Pennsylvania."

In the event that a timely and complete application for renewal has been submitted and the Department is unable, through no fault of the permittee, to reissue the general permit or approval for coverage before its current coverage expiration date, the terms and conditions of the approved coverage will automatically continue and will remain fully effective and enforceable pending the issuance or denial of the renewal for permit coverage, provided the permittee is, and has been, operating in compliance with the terms and conditions of the general permit.

**Department of Environmental Protection
Regional Offices
(and Counties Served)**

I. Bucks, Chester, Delaware, Montgomery, Philadelphia.

Southeast Regional Office
2 East Main Street
Norristown, PA 19401
Phone: (484) 250 - 5960

II. Carbon, Lackawanna, Lehigh, Luzerne, Monroe, Northampton, Pike, Schuylkill, Susquehanna, Wayne, Wyoming.

Northeast Regional Office
2 Public Square
Wilkes-Barre, PA 18711-0790
Phone: (570) 826 – 2516

III. Adams, Bedford, Berks, Blair, Cumberland, Dauphin, Franklin, Fulton, Huntingdon, Juniata, Lancaster, Lebanon, Mifflin, Perry, York.

Southcentral Regional Office
909 Elmerton Avenue
Harrisburg, PA 17110-8200
Phone: (717) 705 – 4706

IV. Bradford, Cameron, Centre, Clearfield, Clinton, Columbia, Lycoming, Montour, Northumberland, Potter, Snyder, Sullivan, Tioga, Union.

Northcentral Regional Office
208 West 3rd Street - Suite 101
Williamsport, PA 17701
Phone: (570) 327 – 3653

V. Allegheny, Beaver, Cambria, Fayette, Greene, Somerset, Washington, Westmoreland.

Southwest Regional Office
400 Waterfront Drive
Pittsburgh, PA 15222-4745
Phone: (412) 442 – 4000

VI. Armstrong, Butler, Clarion, Crawford, Elk, Erie, Forest, Indiana, Jefferson, Lawrence, McKean, Mercer, Venango, Warren.

Northwest Regional Office
230 Chestnut Street
Meadville, PA 16335-3481
Phone: 814-332-6848