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Mr Michael Owens
Inspector
Office of Climate Change, Licensing & Resource Use
Environmental Protection Agency
Headquarters
PO Box 3000
Johnstown Castle Estate
County Wexford

29th March 2013

Waste Licence W0195-02

Re: Response to Article 16 Request
Our Reference: W0195-02/13//01

Dear Mr Owens,

Please find below our response in relation to the Article 16(1) Request dated the 5th March;

- 1. It is stated in your reply to the Agency's Article 14 notice of the 19th August 2011 that the waste types as listed in the table on pages 42 and 43 of the reply can be accepted at the facility. Please provide confirmation that this list of particular waste streams has been approved by the Agency for acceptance at your facility. Please provide a copy of that approved notice if available.*

Condition 1.4 of our existing waste licence (Technical Amendment A) W0195-01 states that "Unless otherwise agreed with the Agency. Only the wastes as outlined in Schedule A: Waste Acceptance of the license and as listed under Annex 1 of the EC Working Document (Biological Treatment of Biowaste (2nd Draft), 2001 or subsequent amendments shall be accepted at the facility for the production of compost or stabilised biowaste". The list provided on pages 42 and 43 of the Article 14 response was taken from Annex 1 of the EC Working Document (Biological Treatment of Biowaste (2nd Draft), 2001 (Pages 11-15).

- 2. Confirm whether the preparation of an EIS was considered mandatory by the planning authority.*

Planning permission was sought from Meath County Council and the preparation of an EIS was considered mandatory by the authority.

- 3. Confirm whether Animal By Product and non Animal By Product feed stocks are currently stored and or processed separately.*

Committed to Quality

Company Reg No. 072366
Vat No. IE 45373331



The majority of feedstock accepted at the facility (96%) is catering waste/brown bin which is categorised as animal by product. All feedstock accepted is processed together within the compost building.

4. *Confirm whether the facility is currently approved by the Department of Agriculture, Food and Marine to operate a composting facility in accordance with the Animal – By- Products Regulations.*

Please find attached a copy of our current approval Appendix 1. In relation to the proposed extension Stage 1 approval has already been received from the Department of Agriculture, Appendix 2.

5. *Confirm whether Planning permission has been obtained for the proposed works/building extension and for the increased intake of waste.*

Planning permission was received from An Bord Pleanála on the 24th January 2011 Planning Register Reference Number KA/901007; please find enclosed a copy of the planning in Appendix 3

6. *Confirm the nature of any building works that have been completed since the waste licence application was submitted to the Agency.*

Since the waste application was made we have upgraded our odour abatement system with the addition of an acid scrubber and we also enclosed our open composting bays into enclosed tunnels in order to allow us to treat processed air more effectively. No further building works have been completed however groundwork's commenced in February 2013.

7. *In relation to the proposed "agricultural grade" compost, please confirm the following;*

A – The nature of the proposed standard that will be applied to the compost.

There is currently no Irish Standard in place for this compost so Kilmainhamwood Compost would be satisfied if a clause was placed in the license confirming that once a standard is in place in Ireland subject to prior agreement from the Agency or that the Compost conforms to the level of stability for compost similar to that of the German standard Rottegrad III. Appendix 4 contains a copy of the German standard Rottegrad III and an abstract of the German methods book for the analysis of compost.

Currently 97% of total compost produced at Kilmainhamwood Compost goes to Agriculture. Compost is very beneficial to soil supplying organic matter, bio-life and nutrients, however compost that has been stabilised to a high degree will release its nutrients more slowly as they are locked in to the humus structure. In Germany "Fresh Compost" is their agricultural grade compost and is mature for end use in agriculture. With a lower level of stability the end user can see the benefit in using it ahead of fully stabilised compost. Feedback from end users has

shown that Agriculture grade compost is more beneficial to crops and hence creates a greater demand for compost.

B – Whether the compost will require compliance with the Animal- By-Products Regulations?

Yes the compost will have to comply with Dept of Agriculture ABP Regulations. Currently Kilmainhamwood Compost meets the European Standard i.e. compost is 12mm particle size or less and has a temperature of 70 C for 60 consecutive minutes. The Agricultural grade compost proposed will also meet this European standard.

C- Whether the compost will be pasteurised?

Yes the compost will be pasteurised/sanitised to ABP Dept of Agriculture Regulations.

D- What the difference will be between the proposed grade of compost and the current standard in the licence?

The only difference between the proposed grade of compost and compost meeting the current standard is the parameter of stability of the compost. It is common that the parameters of maturity and stability in compost are being confused with each other. It is recognised in the industry that no one level of stability in compost suits all end uses e.g. agricultural/fresh compost being supplied to farmers in Germany is not mature enough to be bagged as a peat substitute for landscapers but is mature enough and more beneficial to plant growth than fully stabilised compost. Maturity of a compost means that the compost is “fit for purpose”, Agriculture/fresh grade compost is mature for the end use in agriculture. It still has all the safe guards in place for safe use and has all the benefits of compost but it can release its nutrients quicker for plant uptake and hence supports plant growth better.

E- Whether consultation on the proposed compost grade has taken place with other relevant stakeholders such as DOECLG and/or Cre?

Yes, the level of stability in compost has been discussed in depth by all stakeholders. There is consensus that no one value of stability can suit all end uses. The benefits to crop growth receiving agricultural grade compost has shown that stability is not the same as maturity and that compost needs to be fit for purpose. As a member of the working group that developed I.S.441 2011 I am aware of the many discussions around this topic, the general consensus was that there will be another standard developed for agricultural grade compost which will have all the same parameters as S.I.441 except for stability so the compost can be mature for agricultural end use.

F – *The nature of the anaerobic conditions and the risk of odour that may exist after the sale of the compost*

Agriculture Grade compost will have reached a maturity fit for its end use. In Germany Fresh compost is mature for end use in agriculture and is stabilised to Rottergrad III. Agricultural grade compost is aerobic and does not have an anaerobic condition. From CRE study tours in Germany where fresh compost was being spread by facilities and there were no odour issues associated with the activity.

8. *Confirm the nature of any recommendations from the Odour Impact Assessment Report that have been implemented at the facility to date.*

Odour Monitoring Ireland carried out the Odour Impact Assessment at the facility. The following were recommendations contained within the report and which have all been completed on site;

- The composting bays to be enclosed - Air was extracted directly from the composting bay into the upgraded abatement system. This phase meant that only processed air was treated without dilution from the building air. This allows the odour abatement upgrade to work more efficiently and makes a better working environment in the composting building due to the absence of steam which is produced from the compost process.
- An Acid Scrubber will be installed prior to the biofilter - Odour Monitoring Ireland were contracted to design and oversee the installation of an acid scrubber for treating process air before it goes to the biofilters.
- Optimum biofilter media will be installed – Both biofilter media were changed out during this project and the new media contained shredded roots and trees which were used in both biofilters. Both biofilters continue to perform well and stay within trigger levels and support good bio life.

9. *Confirm how the liquid from the acid scrubber unit is being, or will be, managed*

Currently all the liquid (blow down) from the acid scrubber is sprayed on the finished compost as an artificial fertiliser. It complements the compost by increasing its moisture content which helps in maturation of the compost. It also increases the total nitrogen content of the compost from approximately 2.1% to 3.1%. Before we initiated this process on site the total nitrogen (2.1%) was locked in and very slow released to crops. This had the added problem of preventing crop growth at start up just after compost spread. Now by adding the acid scrubber blow down liquid the extra 1% of total nitrogen added enhances plant growth right from the start.

10. *Confirm how vehicle wash waster is managed*

Vehicles are currently washed inside the main facility building with wash water being encompassed back into the feedstock and mixed with amendment material. The proposed new extension will have a ramp to allow vehicles to tip directly down into a bay so only wheels and the back of the trailer will be washed on tipping material. This wash down will be drained back into the building and used to amend feedstock.

11. *It is noted that the surface water in the drainage ditch lying to the east of te facility is monitored at points both up and down stream of the storm water discharge. Please confirm whether the actual discharge itself is monitored.*

Surface water monitoring takes place from two monitoring locations one upstream SW2 and one downstream SW1, the actual discharge itself is not monitored as per conditions of our existing waste licence W0195-01


No additional or revised drawings will be required to be submitted in light of the further information which we have provided above.

A revised non-technical summary is not required.

Should the EPA have any queries on the above please do not hesitate to contact the Tom on 086-856 3431 or Mercedes on 086-8241034.

Yours sincerely,


Tom Mc Donnell
Compost Facility Manager


Mercedes Kavanagh
Environmental Manager

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Appendix 1

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Certificate of Approval

Approval under the European Communities (Transmissible Spongiform Encephalopathies and Animal By-products) Regulations (S.I. No 252 of 2008) (as amended) and in accordance with Regulation (EC) No. 1069 of 2009 and Regulation (EU) No. 142 of 2011.

This is to certify that

**Padraig Thornton Waste Disposal Ltd.,
T/a Thorntons Recycling Ltd.,
Unit S3B,
Parkwest Business Park,
Dublin 12.**

has been approved by the Minister for Agriculture, Food and the Marine, in accordance with the provisions of the above regulations, to continue to operate Kilmainhamwood Compost, located at Ballynalurgan, Kilmainhamwood, Kells, Co. Meath as a **Composting Plant**

Approval Number: Comp 06

This approval is valid from 3rd December 2012 to 3rd December 2013

The approval is subject to the general and specific conditions set out overleaf.

Please note that failure to comply with these conditions may result in enforcement proceedings or the suspension or withdrawal of your approval.

Dated this 3rd Day of December 2012

For the Minister for Agriculture, Food and the Marine



Mairéad Broderick

An Officer authorised in that behalf by the said Minister.

Appendix 2

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Ref No: RNP 6-1 (Comp-06)

20 August 2009

Mr Gary Brady
Padraic Thornton Waste Disposal Ltd (PTWDL)
Unit 53B Henry Road
Park West Business Park
Dublin 12



Dear Mr Brady

I refer to your 1st Stage application dated 17th July 2009, to upgrade Kilmainhamwood Compost, located at Ballynalurgan, Kilmainhamwood, Nobber, Co Meath.

I wish to inform you that a decision has now been made to approve in principle this 1st stage application.

Regarding the changes proposed in the feedstock acceptance area, this is acceptable in principle subject to satisfactory operation of changes and containment of animal by-products and waste water/leachate generated, so as to avoid environmental contamination.

Conditions for approval and operation of composting plants treating animal by-products in Ireland may be subject to review and amendment by the Minister from time to time to ensure compliance by an owner, operator or person in charge of a Plant as a consequence of changes to the EU or National legislation. The Minister may from time to time inter alia introduce new trader, or general notices relating to these conditions, which shall be published on the Department's web site and/or published in local or national press. It is the responsibility of an owner/operator, or person in charge of a Plant to ensure that a Plant operates in full compliance with all current legislation and other requirements governing the operation of a Plant.

Any changes made to your 1st Stage application will deem this approval in principle invalid and a revised fully completed 1st Stage application must be submitted.

Please find enclosed a 2nd Stage application form for approval to treat animal by-products in composting or biogas plants in accordance with the European Communities (TSE and Animal By-Products) Regulations (S.I. No 252 of 2008 as amended by S.I. No 291 of 2009). Relevant sections of this application form relating to the upgrading of Kilmainhamwood Compost should be completed and submitted with all the required documentation including a validation proposal and revised sections of the Plant's HACCP, as early as possible during the upgrading of the Plant.

Please note that the new processing tunnels cannot be used prior to 2nd stage approval in principle being granted.

Should you have queries in relation to the above, you can contact me at 057- 8694343.

Yours sincerely


Geraldine Lanigan
Animal By-Products Section

Appendix 3

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Our Ref: PL 17.236333
P.A.Reg.Ref: KA901007
Your Ref: P.Thornton Waste Disposal Ltd.

Padraig Thornton Waste Disposal Ltd.,
Trading As Thorntons Recycling,
Unit S3B, Henry Road,
Parkwest Business Park,
Dublin 12.

25 JAN 2011

Appeal Re: Extension to existing composting facility to accept an additional
19,200 tonnes p.a. of non hazardous waste.
Ballynalurgan, Kilmainhamwood, Kells, Co. Meath.

Dear Sir/Madam,

An order has been made by An Bord Pleanála determining the above-mentioned appeal under the Planning and Development Acts 2000 to 2010. A copy of the order is enclosed.

The Board took its decision in this appeal within the statutory time period. However, due to workload constraints, it was not possible to sign and issue the order in the appeal on that day.

In accordance with section 146(3) of the Planning and Development Act 2000, the Board will make available for inspection and purchase at its offices the documents relating to the appeal within 3 working days following its decision. In addition, the Board will also make available the Inspector's Report and the Board's Direction on the appeal on its website (www.pleanala.ie). This information is normally made available on the list of decided cases on the website on the Wednesday following the week in which the decision is made.

In cases where a grant of (full) planning permission is notified by the Board, it is policy to include a copy of the Department of the Environment and Local Government's Leaflet PL11 - **Guide to the Building Control System** and a copy of the Health and Safety Authority's leaflet **Safety and Health on Construction Projects - The Role of Clients** with the notification. These leaflets are issued at the request of the above bodies.

Yours faithfully,

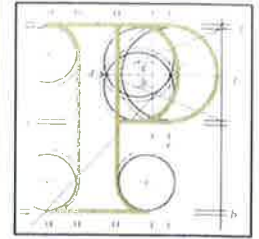


Colm Walsh
Executive Officer

Encl:

BP 100L1N.ltr

An Bord Pleanála

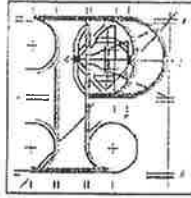


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An Bord Pleanála



PLANNING AND DEVELOPMENT ACTS 2000 TO 2010

Meath County

Planning Register Reference Number: ka/901007

An Bord Pleanála Reference Number: PL17.236333

APPEAL by Ballynalurgan Action Group care of Environmental Management Services of Outer Courtyard, Tullynally, Castlepollard, County Westmeath against the decision made on the 23rd day of February, 2010 by Meath County Council to grant subject to conditions a permission to Padraic Thornton Waste Disposal Limited care of Patrick J. Tobin and Company Limited of Block 10-4, Blanchardstown Corporate Park, Dublin in accordance with plans and particulars lodged with the said Council.

PROPOSED DEVELOPMENT: Extension of the existing composting facility to accept and treat an additional 19,200 tonnes per annum of non-hazardous biodegradable waste (over and above the permitted acceptance and treatment of 20,800 tonnes per annum of non-hazardous biodegradable waste). The development will consist of the construction of two number extensions to the existing compost facility buildings, the construction of a facility administration building (offices, canteen, toilets, locker room and showers), landscaping and other ancillary works required to integrate the proposed extensions and facility administration building into the existing facility within an overall application area of 1.2 hectares all at Kilmainhamwood Compost Facility, Ballynalurgan, Kilmainhamwood, Kells, County Meath as amended by the revised public notices received by the planning authority on the 22nd day of December, 2009.

DECISION

GRANT permission for the above proposed development in accordance with the said plans and particulars based on the reasons and considerations under and subject to the conditions set out below.

MATTERS CONSIDERED

In making its decision, the Board had regard to those matters to which, by virtue of the Planning and Development Acts and Regulations made thereunder, it was required to have regard. Such matters included any submissions and observations received by it in accordance with statutory provisions.

REASONS AND CONSIDERATIONS

Having regard to national policy in relation to waste management, in particular to the "National Strategy on Biodegradable Waste" (2006), the Waste Management Plan for the North-East Region 2005-2010, the provisions of the current Meath County Development Plan and the existing permitted use of the site as a waste composting facility, which is subject to licensing by the Environmental Protection Agency, it is considered that the proposed extension, subject to the conditions set out hereunder, would not seriously injure the residential amenities of the area, would not be prejudicial to public health, would be acceptable in terms of traffic safety and convenience and would accord with both national and regional policy in relation to waste management. The proposed development would, therefore, be in accordance with the proper planning and sustainable development of the area.

CONDITIONS

1. The development shall be carried out in accordance with the plans and particulars, including the Environmental Impact Statement and mitigation measures, lodged with the application 1st July 2009, as amended in the further information submitted to the planning authority on the 22nd December 2009, and in accordance with the details of management, processes and raw materials (inputs and outputs) set out in the documentation received by An Bord Pleanála on the 18th October, 2010, except as may otherwise be required in order to comply with the following conditions.

Reason: In the interest of clarity.

2. This permission is for the composting of non-hazardous biodegradable waste with a maximum intake of 40,000 tonnes per annum.

Reason: To limit the nature and extent of the development in the interest of protection of the amenities of the area.

3. The proposed extension shall be used only as a compost-making facility, in conjunction with the existing structure, and shall not be used for any other waste processing activity or any other class of use contained in Part 4 of Schedule 2 of the Planning and Development Regulations, 2001, as amended, unless authorised by a separate and specific grant of planning permission.

Reason: To limit the proposed development to the terms of the application, having particular regard to the location of the site in a rural area.

4. All sludges, compost and intermediary products shall be stored indoors. No composting materials shall be stored outdoors.

Reason: To safeguard the amenities of the area.

5. All waste for composting, brought to the site, and all composting materials leaving the site shall be delivered and taken away in enclosed containers.

Reason: To safeguard the amenities of the area.

6. Details of the materials, colours and textures of all the external finishes to the extension to the existing composting facility shall be submitted to, and agreed in writing with, the planning authority prior to commencement of development.

Reason: In the interest of visual amenity.

7. All service cables associated with the proposed development shall be located underground within the site.

Reason: In the interest of orderly development and the visual amenities of the area.

8. The site shall be landscaped in accordance with the details submitted to the planning authority on the 22nd day of December, 2009.

Reason: In the interest of visual amenity.

9. The developer shall pay to the planning authority a financial contribution in respect of public infrastructure and facilities benefiting development in the area of the planning authority that is provided or intended to be provided by or on behalf of the authority in accordance with the terms of the Development Contribution Scheme made under section 48 of the Planning and Development Act 2000. The contribution shall be paid prior to the commencement of development or in such phased payments as the planning authority may facilitate and shall be subject to any applicable indexation provisions of the Scheme at the time of payment. Details of the application of the terms of the Scheme shall be agreed between the planning authority and the developer or, in default of such agreement, the matter shall be referred to the Board to determine the proper application of the terms of the Scheme.

Reason: It is a requirement of the Planning and Development Act 2000 that a condition requiring a contribution in accordance with the Development Contribution Scheme made under section 48 of the Act be applied to the permission.

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**Member of An Bord Pleanála
duly authorised to authenticate
the seal of the Board.**

Dated this *24th* day of *January* 2011.

Appendix 4

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RAL-GZ 251

- Frischkompost -

Qualitätsmerkmal	Qualitätsanforderung
Hygiene	<ul style="list-style-type: none"> - Nachweis der seuchenhygienischen Wirksamkeit des Behandlungsverfahrens (direkte Prozessprüfung oder Konformitätsprüfung gemäß Hygiene-Baumusterprüfsystem nach Abschnitt 1.2 der Bundesgütegemeinschaft Kompost e.V. oder andere vom Bundesgüteausschuss im Einzelfall bestimmte Verfahren). - Nachweis der Einhaltung der für die Hygienisierung der Produkte erforderlichen Temperaturen und Temperatur-Einwirkungszeiten (Indirekte Prozessprüfung). - Maximal 2 keimfähige Samen und ausriebfähige Pflanzenteile je Liter. - Substratellen nicht nachweisbar.
Fremdstoffe	<p>Maximal 0,5 Gew.-% i. d. TS auslesbare Fremdstoffe über 2 mm Durchmesser.</p> <p>Bei Fremdstoffgehalten > 0,1 Gew.-%: Maximale Flächensumme der ausgelesenen Fremdstoffe 25 cm²/t FS.</p>
Rottgrad	Rottgrad II oder III.
Wassergehalt	Lose Ware maximal 45 Gew.-%. Für Kompost mit mehr als 40 % Glühverlust gelten maximale Wassergehalte gemäß Anlage 2.
Organische Substanz	Mindestens 30 Gew.-% i. d. TS, gemessen als Glühverlust.
Schwermetallgehalte	<ul style="list-style-type: none"> - Grenzwerte entsprechend den mitgeltenden Rechtsbestimmungen nach Abschnitt 1.1. - Für die Mikroerbstoffe Kupfer und Zink bestimmt der Bundesgüteausschuss Plausibilitätswerte, die nicht überschritten werden dürfen.
Angaben zur Deklaration	<ul style="list-style-type: none"> - Frischkompost (Körnung), - Hersteller, - Rohdichte (Volumengewicht), - pH-Wert, - Salzgehalt, - Pflanzenernährstoffe gesamt (N, P₂O₅, K₂O, MgO), - Pflanzenernährstoffe löslich (N), - Mikroerbstoffe (gemäß den düngemittelrechtlichen Bestimmungen), - basisch wirksame Stoffe (als CaO), - organische Substanz, - Nettogewicht oder Volumen, - Hinweise zur sachgerechten Anwendung.

– Fertigkompost –

Qualitätsmerkmal	Qualitätsanforderung
Hygiene	<ul style="list-style-type: none"> - Nachweis der seuchenhygienischen Wirksamkeit des Behandlungsverfahrens (direkte Prozessprüfung oder Konformitätsprüfung gemäß Hygiene-Baumusterprüfsystem nach Abschnitt 1.2 der Bundesgütegemeinschaft Kompost e.V., oder andere vom Bundesgüteausschuss im Einzelfall bestimmte Verfahren). - Nachweis der Einhaltung der für die Hygienisierung der Produkte erforderlichen Temperaturen und Temperatur-Einwirkungszeiten (indirekte Prozessprüfung) - Maximal 2 keimfähige Samen und austriebfähige Pflanzenteile je Liter - Salmonellen nicht nachweisbar
Fremdstoffe	<ul style="list-style-type: none"> - Maximal 0,5 Gew.-% i. d. TS auslesbare Fremdstoffe über 2 mm Durchmesser - Bei Fremdstoffgehalten > 0,1 Gew.-%: Maximale Flächensumme der ausgelesenen Fremdstoffe 25 cm²/1 FS.
Pflanzenverträglichkeit	Pflanzenverträglichkeit im vorgesehenen Anwendungsbereich, frei von phytotoxischen Stoffen, nicht Stickstoff fixierend (Keimpflanzenversuch).
Rottegrad	Rottegrad IV oder V.
Wassergehalt	Lose Ware maximal 45 Gew.-%, Sackware maximal 35 Gew.-% Für Kompost mit mehr als 40 % OS sind höhere Wassergehalte gemäß Anlage 2 der Güte- und Prüfbestimmungen zulässig.
Organische Substanz	Mindestens 15 Gew.-% i. d. TS, gemessen als Glühverlust.
Schwermetallgehalte	<ul style="list-style-type: none"> - Grenzwerte entsprechend den mitgeltenden Rechtsbestimmungen nach Abschnitt 1.1 - Für die Mikronährstoffe Kupfer und Zink bestimmt der Bundesgüteausschuss Plausibilitätswerte, die nicht überschritten werden dürfen.
Angaben zur Deklaration	<ul style="list-style-type: none"> - Fertigkompost (Körnung), - Hersteller, - Rohdichte (Volumengewicht), - pH-Wert, - Salzgehalt, - Pflanzennährstoffe gesamt (N, P₂O₅, K₂O, MgO), - Pflanzennährstoffe löslich (N, P₂O₅, K₂O), - Mikronährstoffe (gemäß den düngemittelrechtlichen Bestimmungen), - basisch wirksame Stoffe (als CaO), - organische Substanz, - Nettogewicht oder Volumen, - Hinweise zur sachgerechten Anwendung.

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Abstract of the German Methods Book

**for the Analysis
of Compost**

**Publisher:
German Compost Quality
Assurance Organisation (BGK)
Bundesgütegemeinschaft Kompost e.V. (BGK)**

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Methods Book for the Analysis of Compost

Publisher and 7:

Bundesgütegemeinschaft Kompost e.V.(BGK)
Von-der-Wettern Str. 25
D-51149 Köln-Gremberghoven -
Tel.: +49 (0) 22 03/358 370 -
Fax: +49 (0) 22 03/358 37-12 -
Email: info@bgkev.de
Germany

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In collaboration with:

VDLUFA Association of German Farmers
Investigation and Research Institutes
Bismarckstr. 41 a. D-64293 Darmstadt, Germany

BMFT Work Team for Analysis
in the joint project
"New Techniques in Composting"
of the Federal Minister for Research and Technology

Compiled, sponsored and translated by
University of Essen
Waste Mangement
Prof. Dr. W. Bidlingmaier
Universitätsstraße 15
D-45141 Essen
Germany

Translation of the 3rd edition, supplemented and revised, January, 2003
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Preface

Essential prerequisites for a workable quality assurance system have been created with the development of a binding methods book for the investigation of composts within the scope of the outside monitoring of the compost quality by the Federal Compost Quality Assurance Organization FCQAO.

Through the broad distribution that the methods book has had in the meantime and the realization of the 1993 interlaboratory test, a series of competent replies with fruitful criticism of individual methods, regarding feasibility and practicality, have come in at the Federal Quality Association.. Modification and improvement suggestions were discussed by the Federal Quality Association and are reflected in this third edition of the methods book. For the determination of the conductivity, for example, the simpler extraction with distilled water was fallen back on again. Uncertainties that were still existing, such as the calculation of the C/N relationship or the correct designation of the individually determined nitrogen fractions, for instance, were able to also be clarified through additions or explanations. Further supplemental methods for the analysis of composts were proposed to the Federal Compost Quality Assurance Organization and are under discussion at present. These methods will become established in Chapter III in the course of the updated continuation of the method book.

The prerequisites for the qualified analysis of compost have been improved further with the third edition of the method book. Sound and competent quality assurance of composts and compost products can consequently be guaranteed now and in the future.

The 4th issue of the Methods Book contains for the first time the statistical quotations “**frequent range of values**” which shows the 10 - 90 % percentile range and the “**repeatability limit**” which gives a critical difference amount of repeatability limit which is allowed for 2 individual measuring results with a given probability of 95 %. Basis are the repeatability standard deviations of the ring tests carried out by the German Compost Quality Assurance Organization in the years 1993 and 1995. The calculation of the repeatability standard deviations is carried out according to German Standard DIN 55 350 T 13. The repeatability standard deviation as variation parameter is the measure for the repeatability precision and characterizes the efficiency of exact analyzing methods. The repeatability limit result from the multiplication of the repeatability standard deviation with the factor $1.96 \times \sqrt{2}$.

Cologne, February, 2003

Dr. Bertram Kehres, Bundesgütegemeinschaft Kompost e.V. (BGK)

Determination of the degree of rotting in a self-heating test

1 Preliminary remark

The self-heating capability of the fresh compost substance in the Dewar vessel makes a statement possible on the degree of rotting. The self-heating test has to be carried out with an optimum and standardized water content of the samples. Too dry or too moist sample material leads to an underestimate of the self-heating capability and consequently to an overestimate of the degree of rotting. A standardized, optimum water content, adjusted to the water capacity of the respective compost, can be set using the so-called 'fist test'.

2 Sample preparation

Sieving the fresh original sample to ≤ 10 mm.

Adjustment of the water content using a 'fist test'.

3 Materials

- Dewar vessel (volume 1.5 liters, inside diameter 100 mm)
- Straight enclosed-scale thermometer with a maximum display or continuously writing temperature measurement device
- Drying chamber and suitable vessels for the determination of the water content (see also **chapter II.1**)
- Scales (0.1 g reading)

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4 Carrying out the testing

The self-heating test has to be made as soon as possible after taking the sample. If a delay of the start of testing cannot be avoided for organizational reasons, it is necessary after the cool storage to bring the temperature of the cooled sample material onto room temperature at the beginning of the test.

The testing substrate is to be adjusted to a moisture content that is optimum for microbial events, depending on the material, before the start of the test. In the case of composts with a low content of organic substances, the favorable water content is lower than in the case of composts with a high content of organic substances.

4.1 Fist test

The optimum water content is adjusted using a '*fist test*'. A compost sample is pressed in the fist. If water beads escape between the fingers, the sample is too wet. If the sample crumbles without further action when the fist is opened, the sample is too dry. There is a suitable moisture content if the pressed sample crumbles with light pressure; if, on the contrary, it is only deformed, it is too wet. This suitable moisture is also appropriately characterized by the comparison "moist like a well-squeezed sponge". It corresponds to the stage "slightly humid" of the **method 12.3, chapter IV**. During the moistening of the sample material that is too dry, the water has to be evenly mixed in the compost, sample material that is too moist has to be carefully dried.

After the adjustment of an optimum moisture content, the Dewar vessels are filled up to the rim with compost in a loose pouring, lightly shaking the test containers on a base, and the sensor of the temperature measurement device is placed in the lower third of the vessel. The vessels are set up openly at room temperature (approx. 20°C). As a rule the temperature maximum is reached after 2 to 5 days.

The test ends after temperatures exceed the maximum and are clearly falling, at the latest, after 10 days.

If continuous measurement writers or devices with digital measurement value recording (measurement interval 4 hours) are not available, at least 2 measurements with a time difference of at least 8 hours are to be carried out within 24 hours.

5 Calculation and evaluation of the results

The assignment of the rotting degree takes place on the basis of the temperature maximum (T_{\max}).

Table II-1: Assignment of the rotting degree on the basis of the temperature maximum

Rotting degree	T_{\max} [° C]	Product name
I	> 60	Compost raw material
II	50.1 - 60.0	Fresh compost
III	40.1 - 50.0	Fresh compost
IV	30.1 - 40.0	Mature compost
V	= 30	Mature compost

6 Statistics

The measurement fluctuations at the adjustment of the temperature maximum for repeated measurements are indicated by BECKER (1997) and JOURDAN (1988) with < 4 %. The measurement inaccuracy for fresh composts increases with a decreasing rotting degree.

Frequent range of values: 20 - 75 ° C

Repeatability limit: 11.2 %

7 Remarks

The water content of the compost adjusted by using the 'fist test' is to be determined. This is possible without much expenditure, as the water content is determined anyway (compare chapter II.1). If the fist test proves that water has to be added, the water amount and the used compost weight (ml or g) is recorded and added to the water content of the fresh substance. Is the compost to be tested too wet the weight difference before and after drying is to be recorded and subtracted from the actual water content of the sample.

8 Literature

BECKER;G., 1997

Measurement exactitude of the determination of the rotting degree, abstract from thesis, Münster

JOURDAN, B., 1988:

For determination of the rotting degree from composts from waste and waste sludges, Stuttgarter Berichte zur Abfallwirtschaft 30, ESV Erich-Schmidt-Verlag, Berlin

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