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WASHINGTON, D.C. 20460

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OFFICE OF
PREVENTION, PESTICIDES AND
TOXIC SUBSTANCES

MEMORANDUM

SUBJECT: Linuron. Product Chemistry Review for Agan Chemical Manufacturers, Ltd. Linuron Technical. DP Barcode: D202812, D199260, D207775; CBRS No. 13599, 13600, 13237, 14439; MRID Nos.: 429273-01, 429273-02, 429273-03, and 429593-01; Case No. 0047

FROM: David J. Miller, SA HSO, US Public Health Service *David J. Miller*
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THRU: Francis B. Suhre, Section Head *Francis B. Suhre*
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Chemistry Branch II--Reregistration Support
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TO: Karen Jones, PM Team 73
Reregistration Branch
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CBRS has been requested to review a submission from Du Pont in which Du Pont requests to use Linuron technical manufactured by [REDACTED] as its sole source of linuron. Du Pont no longer manufactures linuron technical and is requesting approval to use the [REDACTED] as its new source. CBRS had previously reviewed the product chemistry associated with the [REDACTED] (as an alternate source) and had been unable to declare the products equivalent, pending receipt of certain additional information.

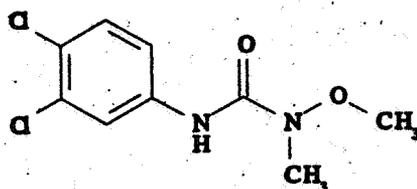
The structure of linuron is shown below:

PRODUCT INGREDIENT SOURCE INFORMATION IS NOT INCLUDED

INERT INGREDIENT INFORMATION IS NOT INCLUDED



Recycled/Recyclable
Printed with Soy/Canola ink on paper that
contains at least 50% recycled fiber



CONCLUSIONS

1. The requirements established by GDLN 61-1 (Product Identity and Disclosure of Ingredients) have been satisfied. The registrant has provided sufficient information in response to an earlier CBRS review (R. Perfetti, 8/19/92, CBRS No. 8489) in which several deficiencies were cited. No additional information is required.
2. The requirements established by GDLN 61-2 (Description of Starting Materials and Manufacturing Process) have been satisfied. The registrant has provided sufficient information in response to an earlier CBRS review (R. Perfetti, 8/19/92, CBRS No. 8489) in which several deficiencies were cited. No additional information is required.
3. The requirements established by GDLN 61-3 (Discussion of Formation of Impurities) have been satisfied. The registrant has provided sufficient information in response to an earlier CBRS review (R. Perfetti, 8/19/92, CBRS No. 8489) in which several deficiencies were cited. No additional information is required.
4. The requirements established by GDLN 62-1 (Preliminary Analysis) have been satisfied. The registrant has provided sufficient information in response to an earlier CBRS review (R. Perfetti, 8/19/92, CBRS No. 8489) in which several deficiencies were cited. No additional information is required.
5. The requirements established by GDLN 62-2 (Certification of Limits) have been satisfied, and the newly submitted CSF dated 9/14/93 adequately reflects the information from the 5-batch analysis cited in MRID 41976501.

6. The requirements established by GDLN 62-3 (Enforcement Analytical Methods) have been satisfied. The registrant has provided sufficient information in response to an earlier CBRS review (R. Perfetti, 8/19/92, CBRS No. 8489) in which several deficiencies were cited. No additional information is required.

RECOMMENDATIONS

The registrant should be informed that the only remaining product chemistry data gaps for linuron technical manufactured [REDACTED] are GDLN series: 63-16 (Explosibility), 63-17 (Storage Stability), and 63-20 (Corrosion Characteristics).

PRODUCT INGREDIENT SOURCE INFORMATION IS NOT INCLUDED

DETAILED ANALYSIS

In response to the Linuron Reregistration Standard Update dated 6/20/90 and the Linuron Data Call-In dated 10/1/90, Du Pont previously submitted one volume of product chemistry data (1991, MRID 41745201) for the basic formulation of the 95% technical and two volumes of product chemistry (1991; MRIDs 41976501 and 41976502) for an alternate source of the 95% T produced by [REDACTED]. Following review of this material, CBRS required that additional information (detailed below) be submitted. (R. Perfetti, CBRS No. 8489, 8/19/92).

In a letter dated September 16, 1993, Dupont provided five additional submissions in an attempt to satisfy previous CBRS concerns raised by the 8/19/92 review, as follows:

- (i) A revised CSF which includes corrections suggested by the previous reviewer
- (ii) A supplemental report entitled "Linuron Technical--Validation of Analytical Method for Organic Impurities" which addresses CBRS's request for additional validation on minor impurities and provides an enforcement method for those impurities >0.1%.
- (iii) A study "Determination of Nitrosamines in Linurex Technical", conducted to respond to the agency request for preliminary analysis on nitrosamines
- (iv) A supplemental report entitled "Linuron Technical--Response to EPA Product Chemistry Review of 14 June, 1993)" which provides a description of the starting material and manufacturing process, and also discusses the formation of impurities. The analytical work on the volatiles component is also included in this supplement
- (v) The supplement to "Determination of TCAB, TCAOB, and TCB in Technical Grade Linuron for Product Chemistry Portion of EPA Registration" responds to the Agency's request for further validation data and questions about the enforcement methods for these microcontaminants.

The following paragraphs evaluate Du Pont's response to each of the issues previously raised by CBRS as they pertain to the approval of the [REDACTED]. These are arranged below by guideline.

GLDN 61-1 Product Identity and Disclosure of Ingredients

Du Pont had submitted information for the alternate formulation of the 95% T [REDACTED] including a CSF dated 8/6/91. CBRS previously concluded (R. Perfetti, 8/19/92, CBRS No. 8489) that the data did not support the requirements of GDLN 61-1 regarding product identity for the Du Pont 95% T [REDACTED] for the following reasons:

- (i) two impurities were incorrectly identified on the CSF
- (ii) the volatiles component was not adequately characterized, given that an EPA List 2 inert [REDACTED] is used in the manufacturing process;
- (iii) the nominal concentrations of the impurities listed on the CSF do not reflect the results of the preliminary analysis;
- (iv) two impurities listed on the CSF are pesticidally active and therefore must be identified as active ingredients and must be included on the label claim; and
- (v) the label claim reflects the lower certified limit of the active ingredient rather than the nominal concentration.

CBRS has evaluated Du Pont's newly submitted MRIDs and newly submitted CSF. Conclusions with respect to the above-described deficiencies are discussed in the attached Confidential Appendix to this review.

GLDN 61-2 Description of Starting Materials and Manufacturing Process

In response to the Linuron Reregistration Standard Update dated 6/20/90, Du Pont has previously submitted information concerning the suppliers and specifications of the starting material along with a complete description of the manufacturing process for the alternative formulation [REDACTED]. CBRS previously concluded (R. Perfetti, 8/19/92, CBRS No. 8489) that the data did not support the requirements of GDLN 61-2 regarding starting materials and manufacturing process for the following reasons:

- (i) the registrant did not provide information concerning the producers and specifications of two of the starting materials
- (ii) the registrant did not provide information regarding the duration of

PRODUCT INGREDIENT SOURCE INFORMATION IS NOT INCLUDED

each step and of the entire process; and

- (iii) the registrant did not provide a description of any purification measures;

CBRS has evaluated Du Pont's newly submitted MRIDs (specifically, MRID 42927302). Conclusions with respect to the above-described deficiencies are discussed in the attached Confidential Appendix to this review.

GLDN 61-3 Discussion of Formation of Impurities

In response to the Linuron Reregistration Standard Update dated 6/20/90, Du Pont had previously submitted information concerning the formation of impurities in the manufacturing process for the alternative formulation [REDACTED] CBRS previously concluded (R. Perfetti, 8/19/92, CBRS No. 8489) that the data did not support the requirements of GDLN 61-3 regarding formation of impurities for the following reasons:

- (i) the registrant did not account for the presence of several impurities listed on the CSF.
- (ii) the registrant did not include a complete discussion of the following potential sources of impurities:
 - carryover of starting materials and impurities present or believed to be present in the starting materials
 - the degradation of ingredients in the product after its production, but prior to use;
 - post-production reactions between the ingredients in the product;
 - migration of packing components into the product
 - carryover of contaminants from use of the manufacturing equipment for other products
- (iii) the registrant did not discuss the potential for formation of nitrosamines;

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CBRS has evaluated Du Pont's newly submitted MRIDs and makes the following conclusions with respect to the above-described deficiencies:

With respect to the missing information concerning the presence of several [REDACTED] impurities listed on the CSF, CBRS has reviewed the submitted MRID and concludes that this deficiency has been resolved, with Du Pont including a discussion of the formation of all impurities listed on the CSF.

With respect to the missing information regarding the source of a variety of potential impurities, Du Pont has included this information, and CBRS concludes that this deficiency is resolved.

With respect to the missing discussion concerning the potential for formation of nitrosamines, Du Pont has now included this information, and CBRS concluded that this deficiency is resolved.

GLDN 62-1 Preliminary Analysis

Du Pont had previously submitted preliminary analysis data for five lots of the alternate formulation of the 95% T produced by Agan. Preliminary analysis data were submitted from the same five lots and an additional lot reflecting analysis for TCAB, TCAOB, and TCB. Per CBRS previous review (R. Perfetti, 8/19/92, CBRS No. 8489), these data did not satisfy the requirements regarding preliminary analysis for the alternate formulation of the Du Pont 95% T produced by Agan for the following reasons:

- (i) preliminary analyses for nitrosamines was not submitted.
- (ii) inadequate validation data were submitted to support the methods used to determine several organic impurities listed on the CSF; and
- (iii) the registrant should further analyze for [REDACTED] an EPA List 2 inert;

CBRS has evaluated Du Pont's newly submitted MRIDs. Conclusions with respect to the above-described deficiencies are discussed in the attached Confidential Appendix to this review.

PRODUCT INGREDIENT SOURCE INFORMATION IS NOT INCLUDED

GLDN 62-2 Certification of Limits

Du Pont had previously submitted a CSF dated 8/6/91 (MRID 41976501) for the alternate formulation of the 95% T produced [REDACTED]. CBRS previously concluded that these data do not satisfy the requirements regarding preliminary analysis for the alternate formulation of the Du Pont 95% T produced [REDACTED] for the following reason: the upper certified limits proposed for the impurities do not reflect the results of preliminary analysis. The registrant was thus required to explain the basis for determination of the certified limits.

CBRS has evaluated Du Pont's newly submitted MRIDs and makes the following conclusions with respect to the above-described deficiencies:

As described in the section of this review referring to GDLN 61-1, the newly submitted CSF dated 9/14/93 appropriately reflects the upper certified limits that would be derived from the preliminary (5-batch) data presented in MRID 41976501. CBRS notes, however, that the upper limits listed on the CSF do not appear to reflect values two standard deviations from the nominal concentrations, as indicated in the Du Pont correspondence submitted with the CSF (dated March 31, 1994). Nevertheless, CBRS will accept the certified limits stated on the newly submitted 9/14/93 CSF as appropriately reflecting upper and lower limit concentrations determined from the 5-batch analyses.

GLDN 62-3 Enforcement Analytical Methods

Du Pont had previously submitted analytical methods for the impurities of the alternate formulation of the 95% T produced [REDACTED] (1991; 41976501). While CBRS previously concluded that adequate validation data were submitted to support the method, the submitted data did not ultimately satisfy Guideline requirements for the following reasons:

- (i) an enforcement method was not provided for the TCAB, TCOAB, and TCB microcontaminants.
- (ii) the HRGC/MS analysis used for preliminary analysis may not be suitable as an enforcement method because it requires the use of materials not readily available

CBRS has evaluated Du Pont's newly submitted MRIDs (specifically, MRID 429273-03). Du Pont (in this submission) states that the HRGC/MS method was intended as the enforcement method for the TCAB, TCAOB, and TCB microcontaminants (they

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indicated that the original title page inadvertently omitted the clear indication that it was also being submitted to fulfill GDLN 62-3 requirements). They further indicate that the method now meets the requirements for an enforcement method since all materials used are now commercially available; specifically, they indicate that ¹³C-TCB internal standards are now available from Cambridge Isotope Laboratories (Woburn, MA; Tel. No. 800-322-1174; Cat No. CAT-EC1404); CBRS has verified this availability and now concludes that the submitted enforcement method for determination of minor impurities and microcontaminants is adequate and GDLN requirements are fulfilled.

cc RF, SF, List A File., Circ., DJM.
RDI: FSuhre:12/7/94; MMetzger:12/7/94

Attachment
CONFIDENTIAL APPENDIX
4 pages

Linuron

Page _____ is not included in this copy.

Pages 11 through 14 are not included in this copy.

The material not included contains the following type of information:

- Identity of product inert ingredients.
- Identity of product impurities.
- Description of the product manufacturing process.
- Description of quality control procedures.
- Identity of the source of product ingredients.
- Sales or other commercial/financial information.
- A draft product label.
- The product confidential statement of formula.
- Information about a pending registration action.
- FIFRA registration data.
- The document is a duplicate of page(s) _____.
- The document is not responsive to the request.

The information not included is generally considered confidential by product registrants. If you have any questions, please contact the individual who prepared the response to your request.

PRODUCT CHEMISTRY DATA SUMMARY
 du Pont 95% T (EPA Reg. No. 352-326): [REDACTED]

Guideline Number	Requirement	Requirement Fulfilled?	MRID Number
61-1	Product Identity and Disclosure of Ingredients	Y	41976501, 42927301
61-2	Beginning Materials and Manufacturing Process	Y	41976501, 42927301
61-3	Discussion of Formation of Impurities	Y	41976501, 42927301
62-1	Preliminary Analysis	Y	41976501, 41976502, 42959301, 42927302, 42927303
62-2	Certification of Ingredient Limits	Y	41976501
62-3	Analytical Methods to Verify the Certified Limits	Y	41976501 429273-03
63-2	Color	Y	42213301
63-3	Physical State	Y	42213301
63-4	Odor	Y	42213301
63-5	Melting Point	Y	42213301
63-6	Boiling Point	N/A	
63-7	Density, Bulk Density or Specific Gravity	Y	42213301
63-8	Solubility	Y	42213301
63-9	Vapor Pressure	Y	42213303
63-10	Dissociation Constant	Y	42213302
63-11	Octanol/Water Partition Coefficient	Y	42213302
63-12	pH	Y	42213301
63-13	Stability	Y	42213301
63-14	Oxidizing or Reducing Action	Y	42213301
63-15	Flammability	N/A	
63-16	Explosibility	N	
63-17	Storage Stability	N	
63-18	Viscosity	N/A	
63-19	Miscibility	N/A	
63-20	Corrosion Characteristics	N	

* Data are required for the [REDACTED] until the registrant has demonstrated that this is an alternate formulation under the criteria of 40 CFR §152.43.

PRODUCT INGREDIENT SOURCE INFORMATION IS NOT INCLUDED

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