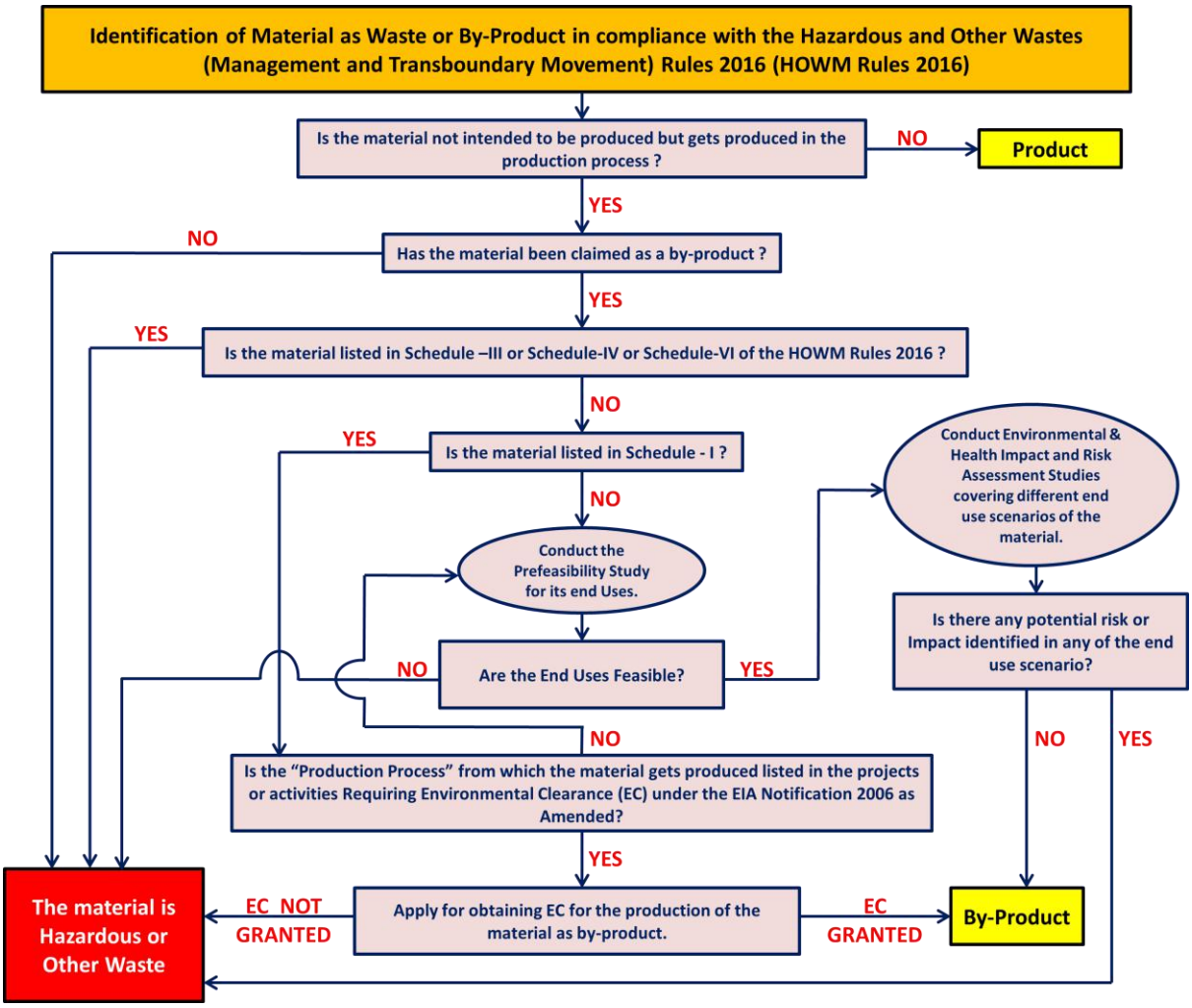
Guidelines for Identification of Materials Generated from Industrial Processes as Wastes or By-products

[Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016]



(May, 2019)

Central Pollution Control Board
(Ministry of Environment, Forest and Climate Change)
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Contents

1.0 Background

Industrial process may also generate waste(s) and by-product(s) besides products(s). The management of Hazardous and Other wastes in India is regulated as per the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016 (HOWM Rules, 2016)

The "waste" is defined under Clause 3(1) (38) of the HOWM Rules 2016 as follows:

Waste means materials that are not products or by-products, for which the generator has no further use for the purposes of production, transformation or consumption. The explanation incorporated further for the purposes of this clause states as follows:

(i) Waste includes the materials that may be generated during, the extraction of raw materials, the processing of raw materials into intermediates and final products, the consumption of final products, and through other human activities and excludes residuals recycled or reused at the place of generation; and

(ii) By-product means a material that is not intended to be produced but gets produced in the production process of intended product and is used as such.

The HOWM Rules are silent about the conditions in regard to the suitability of the "as such use" of the material that is not intended to be produced but gets produced in the production process of intended product for its identification as a by-product. The distinction between when a material generated from a production process should be considered as a "by-product" and when it should be considered as a" waste" is required to be discern critically. In case a "waste" escapes as "by-product", it may get out of ambit of the aforesaid regulations and carry the risk of adverse impacts on human health and environment. On the other hand, if a "by-product" gets categorised as "waste", its generator will have the compulsion of complying with all requisite the requirements prescribed under the said Rules by such generator.

This therefore requires formulation of criteria/guidelines for identification of materials as wastes or by-products.

In order to prepare the aforesaid guidelines, Central Pollution Control Board (CPCB) vide its order (Annexure-I) No.F.No/B-29016(SC)/1/19/WM-II Div./18154 dated March 27, 2019 constituted a Technical Committee for laying down the criteria and preparation of the guidelines for identification of material as waste or by-product in line with the definitions stated in the HOWM Rules 2016. The members of the committee are as follows:

(i) Dr. Ranveer Singh Mahwar, Former Additional Director, CPCB
(ii) Ms Deepti Kapil, Scientist 'D', WM- II Division, CPCB, Delhi

This document is in compliance with the orders dated 12/04/2019 of the Hon'ble National Green Tribunal, Principal Bench, New Delhi, in the matter of Original Application No. 804/2017: Rajiv Narayan & Anr. Vs Union of India & Ors wherein the directions of the Hon'ble Tribunal includes preparation of guidelines or protocol on how to decide a material to be a by-product. The order dated 12/04/2019 is given at Annexure II

Mr. Bharat Sharma, Additional Director and Head of the concerned Division (Waste Management Division-II) ensured his participation in all the meetings of the committee, as requested to him and gave his best possible inputs.

The details of the work done by the committee including, the methodology followed in the process, the findings of the global survey and review study done to get the definitions of wastes and by-products contained in the international regulations including the Basel Convention on the issue, an analysis of the HOWM Rules 2016 and the related environmental legislation specially the EIA Notification 2006,and the steps suggested to be followed for identification of material as waste or by-product are given in the subsequent paragraphs of this report.

The guidelines on identification of wastes and by-products will help in in distinguishing "waste" and "by-product" thereby resulting into effective enforcement of the HOWM Rules.

2.0 Methodology

The methodology followed by the committee included extensive surveys and discussions for, (i) collection and review of the relevant provisions contained in the Basel Convention, the regulations of EU and other countries, (ii) critical analysis of HOWM Rules, 2016 and the related environmental legislation of the country, (iii) the various essential aspect (such as feasibility, environmental and health impacts and risk analysis) needing assessments for identification of a material as a waste material or a by-product and (iv) formulation of the criteria/steps to be followed in the process of deciding a material to be a waste or a by-product.

A summary note (Annexure-II) on the proposed preparation of these guidelines was also posted on the CPCB's website inviting comments from all interested. The comments received were reviewed and incorporated for the best possible inputs.

3.0 Global Scenario on Definitions of Wastes to By-product Relationship and Its Implications

The regulations of the different countries including EU and Basel were reviewed for the definition of wastes, by-products and related terms to explore the criteria that are followed for identification of waste and by-products. This was done to find how these definitions identify a material as 'waste' and how a material is declared as a 'by-product'.

The definitions as laid in the Basel and other international agencies/countries are as follows:

Basel Convention - "Wastes" are substances or objects which are disposed of or are intended to be disposed of or are required to be disposed of by the provisions of national law.

OECD-Waste refers to materials that are not prime products (that is, products produced for the market) for which the generator has no further use in terms of his/her own purposes of production, transformation or consumption, and of which he/she wants to dispose.

UNSD (United Nations Statistics Division)– Wastes are materials that are not prime products (that is products produced for the market) for which the generator has no further use in terms of his/her own purposes of production, transformation or consumption, and of which he/she wants to dispose.

Australia: There are a number of definitions of waste that are in use for a variety of purposes across Australia. In-fact the same material has been defined and classified differently depending on the purpose of the classification, both within a jurisdiction and across jurisdictional borders of the country.

Japan- "waste" refers to refuse, bulky refuse, ashes, sludge, excreta, waste oil, waste acid and alkali, carcasses and other filthy and unnecessary matter, which are in solid or liquid state (excluding radioactive waste and waste polluted by radioactivity).

European Commission (EU)-

- Waste shall mean any substance or object in the categories set out in Annex I which the holder discards or intends or is required to discard.
- Production residue- a material that is not deliberately produced in a production process but may or may not be a waste.
- A production residue that fulfils the conditions of Article 5(1) of the EU's Waste Framework Directive (WFD) is a by-product. Bearing in mind that any substance or object can be either waste or non-waste, by-products are regarded by definition as non-waste. This means that

by-products should be subject, where applicable, to legislation which excludes waste from its scope.

- Article 5(1) WFD sets out the following four conditions that a production residue must meet in order to be considered a by-product:
  - ✓ Further use of the substance or object is certain.
  - ✓ The substance or object can be used directly without any further processing other than normal industrial practice.
  - ✓ The substance or object is produced as an integral part of a production process; and
  - ✓ Further use is lawful, i.e. the substance or object fulfils all relevant product, environmental and health-protection requirements for the specific use and will not lead to overall adverse environmental or human health impacts.
- A production residue is something other than the end product that the manufacturing process directly seeks to produce. Where the production of the material concerned is 'the result of a technical choice', it cannot be a production residue and is considered a product.

The survey revealed that there is a wide range of internationally accepted definitions for wastes, process residue and by- products. These include right from the definition of a waste as "material or an object which the holder decided to discard or intends or is required to discard" to a "material which is destined for storage in a secured landfill or incineration after its all possible use and recovery".

It is observed that most of the waste definitions deal with the existing waste. Such definitions seem to accept the fact that people/institutions throw things away, and therefore, the existing legislations appear to be concerned with the dilemma of 'what to do with it'?. Another problem with most of these definitions is that they do not suggest that creating waste is an unsustainable option. It seems acceptable to discard something no longer wanted, or to create something with no eventual long-term use at all.

The global survey and review study indicate that the existing definitions are not capable of constructing a system, the application of which can clearly provide the description of the about the type of materials that are not intended to be produced but gets produced in the production processes can be used "as such "without any further processing.

The EU scenario, however, appears to show an emerging recognition that the wastes collected for recycling purposes should be defined as secondary raw materials. It also states that "A by-product or residual product does not constitute a waste if it is destined for direct re-use in its existing form and if the use of a residue as a substitute or ingredient is as environmentally sound as the material it is replacing"

The EU regulations have laid conditions for a material that is not deliberately produced in production process to be a by-product and not a waste. The conditions include the feasibility of the material for its intended use as by-product as well as ensuring of the absence of any adverse impact on the environmental, health and other risks in the process. These conditions have therefore been taken into consideration for the preparation of the proposed guidelines.

4.0 Definitions of Waste and By-product in the HOWM Rules 2016 – An Analysis

4.1 Definitions

4.1.1 Hazardous Waste

The Rules 3(1)(17) defines hazardous waste as : any waste which by reason of characteristics such as physical, chemical, biological, reactive, toxic, flammable, explosive or corrosive, causes danger or is likely to cause danger to health or environment, whether alone or in contact with other wastes or substances, and shall include - (i) waste specified under column (3) of Schedule-I; (ii) waste having equal to or more than the concentration limits specified for the constituents in class A and class B of Schedule-II or any of the characteristics as specified in class C of Schedule-II; and (iii) wastes specified in Part A of Schedule-III in respect of import or export of such wastes or the wastes not specified in Part A but exhibit hazardous characteristics specified in Part C of Schedule-III.

4.1.2 Other Waste

The Rule 3(1) (23) defined "other wastes" as wastes specified in Part B and Part D of Schedule-III for import or export and includes all such waste generated indigenously within the country.

4.1.3 Waste

The Rule Section 3(1) (38) defines "Waste" as materials that are not products or by-products, for which the generator has no further use for the purposes of production, transformation or consumption. There is an explanation included in this clause which states that the (i) Waste includes the materials that may be generated during, the extraction of raw materials, the processing of raw materials into intermediates and final products, the consumption of final products, and through other human activities and excludes residuals recycled or reused at the place of generation; and (ii) by-product means a material that is not intended to be produced but gets produced in the production process of intended product and is used as such.

It may be noted here that the wastes are also materials that are never intended to be produced but get produced in the production processes of the intended products and the HOWM Rules 2016 permit identification of only that material as by-product which can be used "as such" without any further processing. **Also, the definition of the by-product given under Rule 3(1) (38) does not specify anything about "as such" as an identification "notwithstanding anything contained in the rest of the provisions of the HOWM Rules 2016 or any other Rules notified under Environment (Protection) Act 1986"**. This implies that the identification of a material as waste or as by-product under this Rule is to be permitted only

if such an identification does not involve anything inconsistent with the rest of the provisions of the HOWM Rules 2016 and only after ensuring compliance to the concerned other Rules notified under the Environment (Protection) Act 1986.

4.2 Transboundary Movement of Wastes and Compliance to the Basel Convention

The Hazardous and Other Wastes Listed in Schedule-III (Import and Export of Hazardous and Other wastes) and Schedule-VI (Hazardous and Other Wastes Prohibited for Import) of the HOWM Rules 2016 are part of the Annexure-VIII and Annexure-IX of the Basel Convention on the Transboundary Movement of Hazardous Wastes.

The Rule 12(7) of the HOWM Rules allows export of the wastes that are prohibited for import (Schedule-VI) with the permission of the Ministry of Environment, Forest and Climate Change. In-fact each of the wastes listed in Schedule-III and Schedule-VI has a specific Basel Number for the purpose of its identification for tacking of its transboundary movement. The Govt of India being a party to the Basel Convention requires these materials to remain identified as wastes for maintaining alignment with the compliance requirements of this convention.

4.3 Recyclable Wastes

The Rule 3(1) 25 defines “recycling” as reclamation and processing of hazardous or other wastes in an environmentally sound manner for the originally intended purpose or for other purposes.

There are a total of 20 commonly recyclable wastes listed in Schedule-IV of the HOWM Rules 2016. The classification of these wastes as recyclable itself implies that they are not suitable for use “as such” in any of the industrial processes and hence cannot be identified as by-products.

4.4 Utilization of Hazardous and Other Wastes as Resource

The Rule 9 (1) of the HOWM permits utilisation of hazardous and other wastes as a resource or after pre-processing either for co-processing or for any other use, including within the premises of the generator (if it is not part of process) after obtaining the permission from the concerned SPCB/CPCB as per the procedure prescribed therein.

This implies that the suitability of the waste for its utilization as a resource is limited to the uses permitted under this Rule without any change in its present status of its identification in the HOWM Rules 2016.

4.5 Schedule-I, Schedule-II and Identification of by-products

4.5.1 Schedule-I

There are a total of 128 types of hazardous wastes generated from 38 different process listed in the Schedule-I. A comparison of this list with the projects/activities prescribed in the Environment Impact Assessment Notification, 2006 shows that the establishment or any change in the activities of the 28 of these 38 processes requires obtaining of Environmental Clearance (EC) from the Prescribed Authority. A total of 99 types of wastes are generated from these 28 processes. The rest of the 10 processes generates 29 types of wastes. This implies that the consideration for any of the type waste that gets generated from the any of the process appearing in the Schedule-I and also covered in the projects/activities listed the EIA Notification, as "by-product" requires the generator to seek Environment Clearance from the concerned Prescribed Authority for such a production.

4.5.2 Schedule-II

This schedule classifies a waste to be hazardous wastes into three classes namely class A, Class B and Class C . Class A: The Class A is based on leachable concentration limits [Toxicity Characteristic Leaching Procedure (TCLP) or Soluble Threshold Limit Concentration (STLC)]. There are a total of 79 constituents (A1 to A79) for which limits of the leachable concentrations have been specified, the exceeding of any of more which means the waste is a hazardous. The Class B is based on the based on Total Threshold Limit Concentration (TTLC). There are only two constituents (B1 and B2) and their respective TTLC limits specified in this class which if exceeded will mean the waste to be hazardous. **The schedule also requires that the hazardous constituents to be analysed in the waste shall be relevant to the nature of the industry and the materials used in the process.**

The Class C classification is based on the hazardous Characteristics of the wastes. A waste that contains any of the 50 constituents listed therein will be considered as hazardous if the waste exhibits any of the 13 characteristics (C1 to C13) listed in this schedule. The 13 characteristics are, Flammable(C1), Corrosive (C2),Reactive or explosive (C3), Toxic (C4), Substances or Wastes liable to spontaneous combustion(C5), Substances or Wastes which, in contact with water emit flammable gases (C6), Oxidizing (C7), Organic Peroxides (C8), Poisons(acute) (C9),Infectious (C10), Liberation of toxic gases in contact with air or water(C11), Eco-toxic (C12) and Capable, by any means, after disposal, of yielding another material, e.g., leachate, which possesses any of the characteristics listed above (C13).

4.5.3 Relevance to Identification of By-product

It is evident from the analysis of the definitions provided in the HOWM Rules2016 that any material that is not intended to be produced but gets produced in any of the process of production of the intended products may get remain as a waste or as a by-product

A clear and consistent distinction between when a material obtained after a production process should be considered as a by-product and when it should be considered as `waste' is of great concern that will significantly influence the enforcement of HOWM Rules 2016.

It is also to be noted here that various inorganic salts, acids, bases, etc. are commonly sold as by-products and used directly without any further processing in various ancillary industries. However, such acids, salts, etc. need to be examined with respect to contaminations, if any, which may have impact on human health and environment and depending upon level of presence or absence of such contaminations, such acids, salts, etc. are required to be categorized as by-product or waste. For instance, generator of spent sulphuric acid from dye &dye intermediates or other chemical manufacturing processes may claim the same as `by-product' arguing that it contains 30-70% sulphuric acid and can be used in Single Super Phosphate (SSP) production but such usage may have adverse impact on soil, water bodies or plant since the spent acid may contain harmful organic compounds, metals, halogen, etc. (depending upon process of spent acid generation) which could be embedded in SSP though in trace level but continuous use of such SSP in agriculture over the years may result in adverse impact on soil, flora, fauna, etc. Hence, such spent acid cannot be declared as by-product and need to be regulated as waste and its utilization as resource recovery, if any, also requires to be regulated by way of preparing SOP/guidelines under Rule 9 of the HOWM Rules, 2016. SPCBs/PCCs are required to discern whether a given material is a waste or by-product. Without this clarity, there is a possibility that the provision of "by-product" in the hazardous waste rules may be misused by hazardous waste generators to escape from the stringent provisions of the rules.

Thus, **the identification of any material as by-product on the other hand will means that the material has been found as a suitable resource in its all the possible end use scenarios and also to the extent that its regulation under the HOWM Rules 2016 is not required except in case of the by-product so identified become surplus or expired or an off specification material requiring disposal as per the provisions of these Rules. This means that the by-product so identified has to be as good as a product in the context of the Feasibility, the Environmental/ Health Impacts and the Risks involved in its all possible end use scenarios.**

5.0 Essential Aspects Involved in the Identification of Materials as Wastes or By-products

(i) Materials that are not intended to be produced but get produced in any of the processes of production of the intended products will invariably contain a variety of hazardous constituents depending upon the nature of the industry and the materials used in the process in which they get produced.

(ii) The materials that are not intended to be produced have no control of their quality. In-fact the quality will be highly dependent even on the level best management practices followed in the production system. This uncertain quality is expected to deteriorate even further in case such materials get identified as by-products which mean their coming out from being regulated under the HWOM Rules 2016 and other concerned National and International environmental legislation that are applicable to the wastes.

(iii) The use as such of such a material may lead a complete change in characteristics including hazardous constituents contained in it. The constituents which are marginally leachable may become completely soluble and even get vaporised resulting into contamination of not only the products made from its use but also into an increased and/or additional release of contaminants in air, water, soil, working environment. This may also result into a total change in the characteristics of the wastes that are generated in its end use process. The use as such of such a material may also result into a non-hazardous waste becoming a hazardous waste and/or recyclable waste becoming a non-recyclable waste in the end use process industry.

(iv) The use of such materials may also result into products which may become unfit for use in the food and pharmaceutical industry.

(v) The use of such a material as substitute of the products already in use may have an adverse impact on the overall economy of the entire process depending upon the production, demand and supply of the products it is replacing and the presence of multiple constituents in the materials that are not intended to be produced. For instance, the use "as such" of the spent HCl (that is generated in the metal surface treatment processes) will not only mean the risk of the HCl produced from the Chlor-Alkali Industry becoming surplus. Moreover, the spent HCl generated from metal surface treatment contains a number of heavy metals which even if assumed to end up as waste in the process of its use will mean a waste with high level of these heavy metals.

(vi) A complete knowledge of the Life Cycle of the constituents present in such materials is a must. This means ensuring availability of the

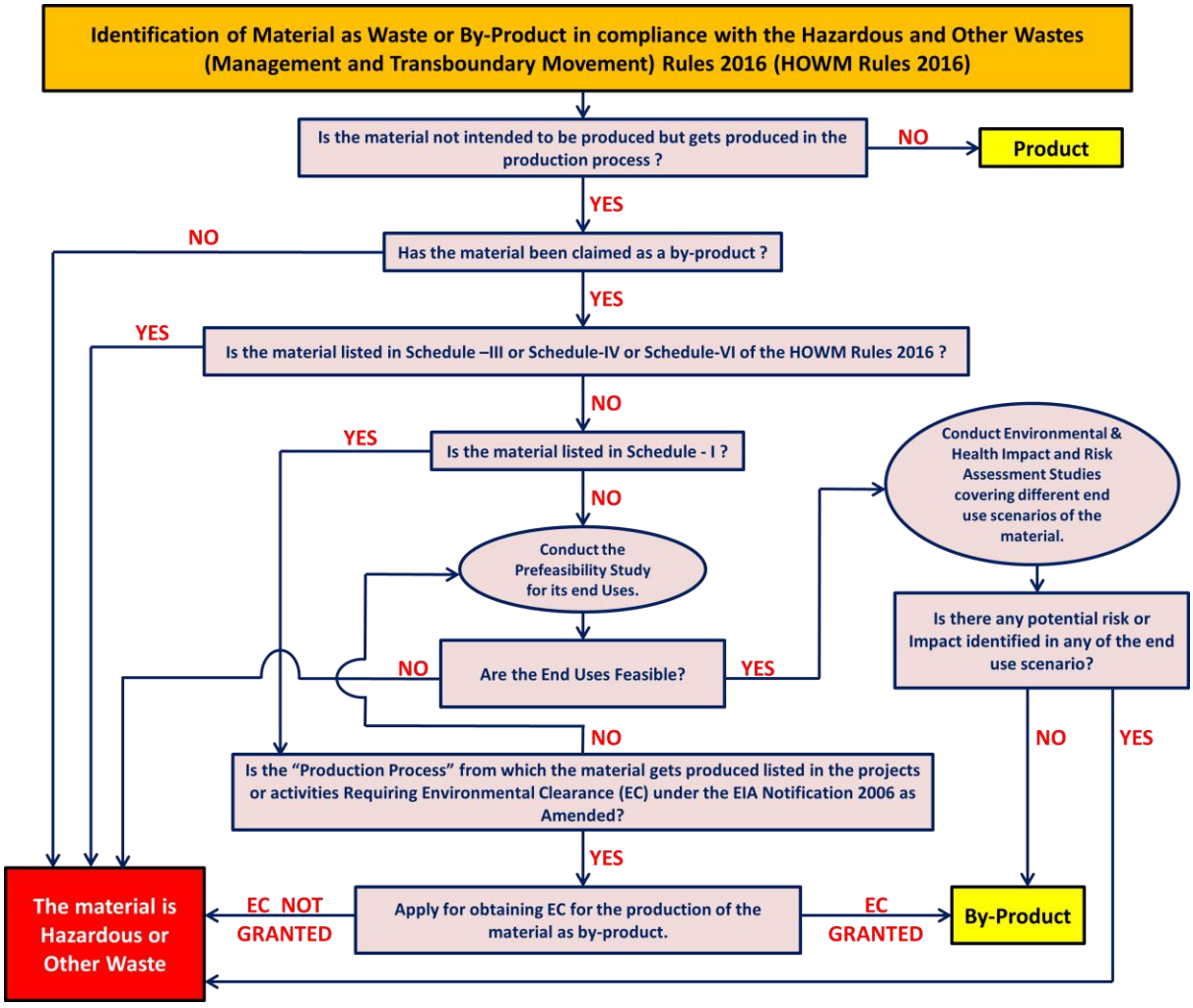
credible data/information on the composition of such materials and the fate of each of the constituent contained in it during its use "as such" process.

(vii) It can be therefore safely concluded that consideration of any such material for its identification as by-product should be based on conducting of a prefeasibility study first and if found feasible conducting of the Environmental and health Impact and Risk Assessment studies for confirmation of the absence of any adverse impacts and risks in the end use of the material as substitute in any other process.

6.0 Criteria for Identification of material as waste or by-product

6.1 Overall Criteria Flow Chart

The overall process for identification of waste as by-product is shown in the figure given below:



Note:

(i) Any material which was identified as hazardous waste under the Hazardous Wastes (Management, Handling and Transboundary Movement) Rules, 2008 will remain as Hazardous or Other Waste under the HOWM Rules 2016 unless the material is identified as a by-product following the above criteria.

(ii) The identification of a material as waste or by-product is to be done on case to case basis for the material that is claimed as by-product and need not be uniformly applied

6.2 Steps to be followed

Step-1

Examine the production process and find out whether the material is "intended to be produced" or "not intended to be produced but gets produced". If the material produced is an intended production it is deemed to be a "**product**". If the material is not intended to be produced but gets produced in the production process and is being claimed as a by- product go to STEP-2.

Step-2

Check the classification of the material claimed as by- product as per the HOWM Rules 2016 and find out whether the material is listed in Schedule-III or Schedule-IV or Schedule-VI of these rules. If the material is appearing in the aforesaid schedules, it is deemed to be a hazardous or other waste. In case the material does not appear in any of these three schedules go to next step.

Step-3

Check whether the material claimed as by- product is listed in Schedule-I of the HOWM Rules 2016. In case it is not listed in this schedule go to Step-4A and if listed in this schedule go to Step-5.

Step-4A

Ask the generator of the material being claimed as by- product to conduct a pre-feasibility study for its end uses. The aspects to be covered (but not limited to) in the pre-feasibility study are given in Appendix-I. In case the end use is found to be feasible go to Step-4B. In case the end use is not found feasible the material remains as hazardous or other waste.

Step-4B

Upon establishing the end use of the material as feasible, ask the generator to conduct environmental &health impact and risk assessment studies covering the different end use scenarios of the material. The aspects to be covered (but not limited to) in these studies are given in Appendix-II. In case the findings of the studies do not indicate any potential risk to the environment, health or other hazards in any of the end use scenarios the material may be identified as "**by-product**" subject to preparation and submission of its Safety Data Sheet by its generator (The OSHA- Hazard Communication Standard for Safety Data Sheets is attached at Annexure-III for reference). In case of any potential risk is identified in the studies the material remains a hazardous or other waste.

Step-5

If the material claimed as by-product is listed in Schedule-I of the HOWM Rules, 2016, check whether the process of production is also listed in the projects or activities which require Environment Clearance (EC) under the EIA Notification 2006 as Amended. In case listed in the EIA notifications go to Step-6 else go to Step-4A.

Step-6

Ask the generator to apply to the concerned authority for obtaining EC for the production of the material as by-product. The studies to be conducted for this purpose should include the aspects given in Appendix-I and Appendix-II. In case the EC is granted the material may be identified as a "**by-product**" subject to preparation and submission of its Safety Data Sheet by its generator as mentioned in Step 4B above. In case EC is not granted the material remains a "**hazardous or other waste**".

7.0 Concluding Remarks

A material that is not intended to be produced but gets produced in the production process of intended product will remain as Hazardous and Other waste in the HOWM Rules 2016 unless it is identified as a by-product following the criteria given in these guidelines to confirm that the material's use "as such" is feasible in the country, does NOT involve any adverse impact on the environmental& humans health and risk of hazards, and its Safety Data Sheet is prepared and submitted by the generator of the material.

Reference Links:

(1) Hazardous Wastes (Management, Handling and Transboundary Movement) Rules, 2008
http://cpcb.nic.in/displaypdf.php?id=aHdtZC9taHRydWxlczIwMDgucGRm

(2) Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016
http://www.iwma.in/HWM%20Rules.pdf

(3) EIA Notification 2006
http://environmentclearance.nic.in/writereaddata/EIA_notifications/2006_09_14_EIA.pdf

(4) EIA Amendment Notification 2009
http://sikenvis.nic.in/writereaddata/S_O%203067-2009.pdf

(5) Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal
https://www.basel.int/Portals/4/Basel%20Convention/docs/text/BaselConventionText-e.pdf

(6) National definition of waste- All Regions/Countries, Parties of the Basel Convention
http://www.basel.int/Portals/4/Basel%20Convention/docs/natreporting/2009/compI/2009-question-2a.pdf

(7) OECD – Glossary of Statistical Terms
https://stats.oecd.org/glossary/detail.asp?ID=2896

(8) UNEP- What is waste - A Multitude of Definitions and Approaches
http://www.grid.unep.ch/waste/html_file/06-07_what_waste.html

(9) Basel Convention Country Fact Sheet
http://archive.basel.int/natreporting/2006/cfs/japan.doc

(10) Waste definitions and classifications- Report on Issues, Opportunities and Information Gaps
http://www.environment.gov.au/system/files/resources/d05aa2d3-be01-44f3-904b-04dd09e9b0a1/files/waste-classification-gaps-part1.pdf

(11) Environment Agency (EU) End-of-waste and by-product hazard and risk assessment
https://s3-eu-west-1.amazonaws.com/is-it-waste/risk-guidance.pdf

(12) Guidance on the interpretation of key provisions of Directive 2008/98/EC on waste
http://ec.europa.eu/environment/waste/framework/pdf/guidance_doc.pdf

(13) COMMUNICATION FROM THE COMMISSION on the implementation of the circular economy package: options to address the interface between chemical, product and waste legislation
https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52018SC0020&from=EN

(14) The health and environmental impacts of hazardous wastes- Impact Profiles
http://www.environment.gov.au/system/files/resources/bc0e52ba-8f78-4ce1-83b4-4910f4a1f0e9/files/hazardous-waste-impacts.pdf

(15) Guidance on the preparation of safety Data Sheets -The United Nations Economic Commission for Europe (UNECE)
https://www.unece.org/fileadmin/DAM/trans/danger/publi/ghs/ghs_rev07/English/07e_annex4.pdf

(16) Hazard Communication Standard: Safety Data Sheets
https://www.osha.gov/Publications/OSHA3514.html

(17) Hazard Communication Standard: Safety Data Sheets
https://www.osha.gov/Publications/OSHA3514.pdf

(18) What is a Material Safety Data Sheet (MSDS)- University of Regina, Canada
https://www.uregina.ca/hr/hsw/assets/docs/pdf/Laboratory-Safety/Material-Safety-Data-Sheet.pdf

Appendix-I

Aspects to be covered (but not limited to) in the pre-feasibility study

(1) Annual quantity of the material generation

(2) Composition of the material and the observed maximum concentration of each of the constituents contained in it (please referrer Schedule-II for identification of the constituents concerning the material).

(3) The product which the material is expected to substitute and its end use process.

(4) Composition of the product presently in use in regard to the concentration of each of the constituent identified under item (2) above.

(5) Acceptability of the material's composition compared to product presently in use specially, in terms of products that are being produced in the process where the claimed by product is proposed to be used.

(6) Impact on the type of the hazardous wastes that are being generated in the process where the claimed by product is proposed to be used. This to be specially seen from the point that the use of claimed by-product may have a negative impact on the usefulness of the hazardous or other waste that is presently getting generated in the end use process.

(7) Present status of the demand and supply of the product presently in use.

(8) Impact on the market of the product as a result of the substitution by the claimed by-product.

(9) Scope for the substitution of the product currently in use especially in case the product itself is not the primary product of the industry where it gets produced. To make it clear here that the HCl is mainly produced as a secondary material in the production caustic soda in the country. Any substitution of its use with the spent HCl will therefore mean the fresh HCl becoming surplus in the caustic Soda Industry and requiring treatment for disposal.

(10) Cost of upgrading (if required) the pollution control measures presently in place specially in the context of their need up gradation for compliance to the conditions of the consent and Authorization.

(11) The overall impact of using the claimed by-product in the process where a fresh product is currently in use in the country in terms of the quality of the products that are being produced and the wastes which get generated.

Appendix-II

Aspects to be covered (but not limited to) in the Environmental & Health Impact and Hazard Risk Analysis Studies*

(1) Annual quantity of the material generation

(2) Composition of the material and the observed maximum concentration of each of the constituents contained in it (please referrer Schedule-II for identification of the constituents concerning the material).

(3) Impact of the use of the claimed by-product on the process with regard to the release of contaminants in the air, water, soil and working halls.

(4) Impact on generation of hazardous and other wastes from the proposed end use process.

(5) Need of making changes in the existing air/water consents and authorization.

(6) Impact on the adequacy of pollution control measures presently in place specially in the context of their need up gradation in compliance.

(7) Expected impacts on the environment and human health. This should be done on the lines of the EIA studies that are done for the new projects and the identification of the environmental and health management plans required to be added.

(8) Analysis of Risks involved in the end use of the material and identification of the additional requirements in the management plans

(9) The overall environment and human health impact of using the claimed by-product in the process where a fresh product is currently in use and the risks involved in doing so.

(10) Justification of the acceptability of the findings.

*** All the studies mentioned above should be conducted by an agency accredited by the National Accreditation Board for Education and Training (NABET), Quality Council of India,for this type of studies.**