BEFORE THE NATIONAL GREEN TRIBUNAL

SOUTHERN ZONE BENCH AT CHENNAI

ORIGINAL APPLICATION NO: 66 OF 2017

IN THE MATTER OF:-

VALLAPUREDDY GARI GOVARDHAN REDDY & ORS.... ...Applicants

Versus

UNION OF INDIA & ORS ... .Respondents

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PLACE: Chennai **DATE: 26.10.2021**

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ADDITIONAL AFFIDAVIT ON BEHALF OF INTERVENERS

1. I, Dr K Babu Rao S/o Lakshminarayana, R/o H.No.4-1-50/2, Road No 3, Snehapuri Colony Hyderabad, Telangana-500076, aged about 74 years presently in Hyderabad do hereby solemnly affirm and declare as under:

2. That I am the Intervener in the above mentioned application and I am fully conversant with the facts and circumstances of the case and therefore competent and I am authorized to swear this affidavit on behalf of the Interveners.

3. That this Hon'ble NGT (SZ) vide its order dated 28.9.2021 allowed the Application for impleadment filed by us and directed to furnish the names of the Countries in which Nanomaterial industries are permitted and what is the regulatory mechanism adopted by the countries and whether EIA studies are conducted before permitting such industries in those countries. It is humbly submitted that according to the Media release dated 25.11.2015 states that the plant capacity of manufacturing at the Respondent industry is 20,000 Tones a year. This shows the size of the proposed industry. The relevant extracts of Press release is reproduced as under:

> "**Media Release Nano Materials Technology Signs Agreement with Santhiram Chemicals (P) Ltd to Supply Technology and Equipment for Manufacturing Nano-precipitated Calcium Carbonate**

> Singapore, Nov 25, 2015 – Nano Materials Technology Private Limited ("NMT") announced today that it has signed a technology licensing agreement with Santhiram Chemicals (P) Ltd (India) for the use of its proprietary High Gravity Controlled Precipitation ("HGCP") Technology to manufacture, market and distribute nano precipitated calcium carbonate ("NPCC") in India.
>
> NPCC is a functional additive in a wide range of applications such as paper, rubber, plastics, architectural materials, coatings, adhesives, Sealant, printing ink and light chemicals.
>
> Under the terms of the agreement, NMT will supply both HGCP technology and reactor to Santhiram in Andhra Pradesh, India. NMT will also provide technical and application support to Santhiram India during the marketing of NPCC in India. **The new NPCC plant has a capacity of 20 thousand tons per year and will be in operation in 2017."**

True copy of the Media release issued by Nano Material Technology Pvt Ltd, Singapore declaring the understanding with the Private Respondent along with particulars of products of Singapore Company are annexed as ANNEXURE A1.

4. That we would like to place the regulatory information gathered from various countries, on the necessity of bringing the nanomaterials under the EIA Notification 2006. **To begin with, we would like to bring to the attention of the Tribunal that some nanomaterials are already being covered under EIA notification 2006 by MoEF&CC**. That the Experts Appraisal Committee of MoEF in the present case also felt that *"With regard to bringing this activity under the purview of the EIA Notification, the committee opined that, **at present there is no requirement to bring manufacture of precipitated calcium carbonate nanoparticles under the ambit of the EIA Notificaiton 2006**".* That the EAC does not completely rule out the requirement of bringing the manufacture of the precipitated calcium carbonate nanoparticles under EIA regime.

It is humbly submitted that the MoEF and EAC have failed to adopt precautionary principle mandated under Environment (Protection) Act, 1986 and the Judgments of the Hon'ble Supreme Court of India and this Hon'ble Tribunal.

5. That most of the specialized nanomaterials are produced at a small scale for specific purposes and not in bulk quantities. Four substances namely Carbon black, Nano Titanium dioxide, Nano Calcium carbonate, and Nano Silica are produced in huge tonnage. According to International Agency for Research on Cancer (IARC), Carbon black is a Group 2B carcinogen and Silica, a Group 1 Carcinogen. That the Article published in Biosensors and Bioelectronics Research Journal by Fabiana Arduini, Stefano Cinti, Vincenzo Mazzaracchio, Viviana Scognamiglio, Aziz Amine, Danila Moscone; Carbon black as an outstanding and affordable nanomaterial for electrochemical (bio) sensor design.

6. It is submitted that the MoEF & CC has granted environmental clearance to a 420,000 TPA carbon black plant at Pudi, Rambili mandal, Visakhapatnam district on 29.03.2011. Besides that there are several carbon black plants in India in Kochi and Ghaziabad etc where the local people have suffered due to pollution and conducted massive protests against carbon black pollution. That the Hon'ble Kerala High Court vide its order dated 7.12.2018 dismissed Crl.R.P.No. 560 of 2018 filed by Philips Carbon Black Limited challenging the Criminal proceedings for causing pollution and conducting expansion activity without appropriate approvals.

True copy of the Judgment dated 7.12.2018 in Crl.R.P. No. 560 of 2018 passed by Hon'ble Kerala High Court is annexed as ANNEXURE A2.

7. That Titanium dioxide plants are also covered under MoEF Notification 2006. The Kerala Minerals and Metals Ltd, Chavara, Kollam, Kerala produces conventional titanium dioxide. Any nano TiO_2 proposal would be included under EIA process as the ministry did for nanofertilizers and not because it is a nanomaterial. It is submitted that Nano form of Titanium dioxide used as food additive is now banned in EU and also in USA. The following reports makes clear that EU and USA have taken action on nano form of Titanium dioxide used as food additive.

"**Food safety: EU to ban the use of Titanium Dioxide (E171) as a food additive in 2022**

Today, Member States approved the European Commission's proposal to ban the use of Titanium Dioxide (E171) as a food additive from 2022. Titanium Dioxide is used as a colorant in a number of products such as chewing gum, pastries, food supplements, soups and broths. Commissioner Stella **Kyriakides**, in charge of Health and Food Safety, said: *"The safety of our food and the health of our consumers is not negotiable. Today, we act decisively with our Member States, based on sound science, to remove a risk from a chemical used in food".* The Commission's proposal is based on a scientific opinion by the European Food Safety Authority, which concluded that E171 could no longer be considered as safe when used as a food additive, in particular due to the fact that concerns regarding genotoxicity cannot be ruled out. Unless an objection is adopted by the end of the year by either the Council or the European Parliament, the text will enter into force in early 2022. This will then kick-off a 6-month phasing out period after which a full ban will apply in food products."

https://ec.europa.eu/commission/presscorner/detail/en/mex_21_5165#5

"In April 2011, the National Institute for Occupational Safety and Health (NIOSH), an arm of the US Centers for Disease Control and Prevention (CDC), published Current Intelligence Bulletin (CIB) 63, *Occupational Exposure to Titanium Dioxide*. NIOSH issued a recommended exposure limit (REL) of 2.4 mg/m^3 for pigmentary titanium dioxide (TiO_2) and 0.3 mg/m^3 for ultrafine TiO_2. NIOSH also concluded that **ultrafine TiO_2 is a potential occupational carcinogen**."

http://www.nanotechia.org/news/news-articles/recommended-exposure-limit-titanium-dioxide

"On May 30, 2017, the U.S. Court of Appeals for the *Ninth Circuit* responded to two petitions for review of the ***U.S. Environmental Protection Agency's (EPA)*** conditional registration of a nanosilver pesticide product and vacated the conditional registration."

"According to the court, the public interest finding is an "essential prerequisite to conditional registration," and EPA failed to support that finding for NSPW with substantial evidence. The court vacated the conditional registration in whole, and did not consider the remaining issues raised by petitioners."

https://www.natlawreview.com/article/ninth-circuit-vacates-conditional-nanosilver-registration

8. That in Indian context itself, Nano fertilizer projects of IFFCO have gone through the ToR and Appraisal process of MoEF. Exemption from

public hearing was given to the nanofertilizer project at Aonla on the basis of it being located in an industrial estate.

9. Recently, Nano Fertilizer project of IFFCO, Paul Pothen Nagar, Bareilly, UP was issued ToR 18 December 2020. It is a new project and the list of products to be made are given in the table copied below.

Table 1 Project at a Glance

S. No.	Particular		Unit	Details
1.	Project Status (New/Expansion/Amendment)		-	New
2.	Products to be manufactured & Capacity	Nano-Nitrogen Nano-Sulphur / Nano-Micronutrients	KL/ Annum	**27375**
3.	Total Plot Area		Ha	2.904

Consideration of Environmental Clearance Proposals

19.1 Modernization and Expansion of Existing Fertilizer Plant for Manufacturing of Nano Fertilizer, Aonla Unit by **M/s Indian Farmers Fertilizer Cooperative Ltd**., Paul Pothen Nagar, P.O. IFFCO Township, District-Bareilly, Uttar Pradesh - Consideration of Environmental Clearance on Oct 25, 2021.

[Proposal No. IA/UP/IND3/228538/2021; File No. J-11011/430/2005-IA-II(I)]"

10. That the IFFCO, Aonla proposal is purely for nanofertilizer production. It does not use any high pressure, high temperature processes or hazardous raw materials as natural gas/naphtha etc. Simply because fertilizers are covered under EIA, nanofertilizers are also included. There is no application of mind or periodic upgradation of substances covered based on science. Only Nano-Nitrogen uses urea and rest of the products do not use any fertilizer produced in a fertilizer plant. Micronutrients are Nano Boron, Nano Zinc, and Nano Copper. They are all inorganic compounds like Nano Precipitated Calcium Carbonate. **By the logic of the Expert Appraisal Committee (Industrial Projects 3) that dismissed the need to include nanomaterials under EIA process, nanofertiizers should not be brought under EIA notification 2006. Processes described for the Nano fertilizers are far simpler than the process for Nano Precipitated Calcium Carbonate (NPCC) and they are produced in liquid phase and sold in bottles as liquid.** The EIA report for the nanofertilizers at Aonla claims "However, with respect to current expansion proposal for setting up of NANO fertilizer plant, no impact with respect to air emission is envisaged as there

shall be no process emission as well no boiler installation." [EIA Report, Page 227]

11. That Precipitated calcium carbonate plant proposed by Shantiram is 700 TPD (200 TPD nano + 500 TPD precipitated) in total and involves highly polluting calcination of limestone releasing substantial quantity of carbon dioxide a greenhouse gas, dust, NOx, sulphur dioxide and heavy metals like mercury and lead. It is similar to a cement plant. Nanomaterial produced in tonnage gets air borne at various stages of the production and especially in the bagging section. Actual field data in a Chinese nano precipitated calcium carbonate (npcc) production plant collected by Ling Cui were quite high at 6000 $\mu g/m^3$ and much higher than the National Ambient Air Quality Standard for $PM_{2.5}$ in India of 40 $\mu g/Nm^3$, with npcc particles about 500 times smaller on average.

12. It may be noted that MoEF&CC has no working definition for a nanomaterial and standards for exposure to them. Regulators in USA and Europe are still debating on adequate regulatory definition for nanomaterial. Enormous amount of regulatory documentation is existing in USA, EU, OECD and even China.

China is producing 50% of the nano precipitated calcium carbonate in the world. According to the Shengda Tech Inc., "Shandong Haize Nanomaterials Co., Ltd and Shanxi Haize Nanomaterials Co., Ltd are our two manufacturing subsidiaries. The former locates in Shandong Province, China and the latter locates in Shanxi Province, China. At present, the NPCC production capacity is 130,000 metric tons per year. We plan to expand the production capacity to 1,000,000 metric tons per year in the future."

https://www.listofcompaniesin.com/Shandong_Shengda_Tech_Inc_Company_1028472.html

EIA Regime on Nanomaterial in China:

13. It is humbly submitted that China covers nanomaterials under the Environmental Impact Assessment Law. The two links given below present public consultation information about a nanomaterial project

for lithium iron phosphate. It is bilingual and we can choose English for display.

https://www.dynanonic.com/ennewsinfo.aspx?id=95

https://www.dynanonic.com/ennewsinfo.aspx?id=94

14. That Shengda Tech Inc., company filed the following information with the Securities and Exchange Commission, USA on October 20, 2010. Link is given below.

"**Pursuant to the Environment Impact Assessment Law, which came into effect on September 1, 2003, the construction or expansion of our NPCC facilities is subject to environment impact assessment procedures by local environmental protection authorities in China, including the acceptance of environment impact assessment reports of each project by the environmental protection authorities.** As of June 30, 2010, we have a total annual production capacity of 260,000 metric tons of NPCC, and we have passed environment impact assessment for 200,000 metric tons of NPCC production, including 60,000 metric tons for our Zibo, Shangdong facility, 120,000 metric tons for our Xianyang, Shaanxi facility, 10,000 metric tons for our Tai'an, Shandong facility and 10,000 metric tons for our Anhui facility. The remaining capacity of 40,000 metric tons of our Xianyang, Shaanxi facility has not yet passed the assessment and is expected to pass the assessment by the end of 2010. In addition, we have not passed the assessment for the remaining 20,000 metric tons for our Tai'an, Shandong facility. **The local environmental regulatory departments where our Xianyang, Shaanxi and Tai'an, Shangdong facilities are located have orally advised us that we may continue to produce NPCC during the process of passing the environmental impact assessment, and we therefore believe that the temporary non-compliance with the Environment Impact Assessment Law has not had in the past and will not have material effects on our capital expenditures, earnings, and competitive position. However, if the environmental regulatory department in Xianyang, Shaanxi or Tai'an, Shangdong or at a higher level determines that we are not compliant with the Environment Impact Assessment Law, we may be subject to fines or other legal sanctions."**

https://www.sec.gov/Archives/edgar/data/1160165/000114420410054583/v199228_s1a.htm

15. While India started Nanotechnology Mission quite early along with other nations, we are left behind in achievements. In research

publications we are a distant third behind China and USA that are far ahead of us.

"We are in the process of forming a regulatory body for the nanotechnology and this will be called Nanotechnology Regulatory Board," Nano Mission Council Chairman C N R Rao said on the sidelines of a three-day International conference on Nano science and Technology that began today at IITB. The news report is reproduced as under:

https://www.business-standard.com/article/economy-policy/india-to-have-nanotechnology-regulatory-board-soon-110021800216_1.html

"The Nano Mission Council today said the country will soon have a Nanotechnology Regulatory Board to regulate the industrial nanotech products that are used in day-to-day life.

"We are in the process of forming a regulatory body for the nanotechnology and this will be called Nanotechnology Regulatory Board," Nano Mission Council Chairman C N R Rao said on the sidelines of a three-day International conference on Nano science and Technology that began today at IIT here.

The Board will be formed most probably next month, Rao said.

"Indian industries are coming out with various nanotechnological products including water filters, biomedical products, several chemicals, cosmetics and paints. Therefore, we are in the process of formulating guidelines to regulate the products for the safety and benefit of the society," Rao, who is also the chairman of Scientific Advisory Council to the prime minister, said.

Asked whether the guidelines have been formulated, Rao said, "Not yet, we are in the process of formulating the guidelines."

The Centre launched a Mission on Nano Science and Technology (Nano Mission) in May 2007. An allocation of Rs 1,000 crore for five years has been made towards it. The Department of Science and Technology is the nodal implementing agency of the Mission, DST director Praveen Asthana said at the inauguration.

The DST had sanctioned $20 million from 2002 to 2007 and the steep increase in the allocation speaks volumes on the importance given by the government to nanoscience and technology, Asthana said.

AEC chairman and Bhabha Atomic Research centre director Srikumar Banerjee said in western India, TIFR, IIT, BARC and the University of Mumbai are working together on complementing aspects of research and development in nanotechnology.

Chairman of Board of Governors of IIT-Mumbai Anil Kakodkar said Nano Mission is a great opportunity for India to make affordable and appropriate solutions for different problems of society.

"For students and entrepreneurs, this is a great chance and we need to strengthen the facilities in the country," Kakodkar said.

The deliberation of the three-day conference include Functional Materials, Novel Synthetic Methods, Hybrids, Fabrication and Devices, Electronics, Magnetics and Photonics, Technology of Medicine (drug delivery system), Materials for Energy and Materials for Food and Environment, conference convenor Dhirendra Bahadur said.

Over 615 delegates, including 70 from abroad, are participating in the conference, he said.

The technical programmes of the Nano Mission are also being guided by two advisory groups, the Nano Science Advisory Group (NSAG) and the Nano Applications and Technology Advisory Group (NATAG), Asthana said.

The Mission is focusing on providing effective education and training to researchers and professionals in diversified fields so that a genuine interdisciplinary culture for nanoscale science, engineering and technology can emerge.

It has launched MSc and M Tech programmes in some of the institutions in the country as part of the human resource development.

As part of the international collaboration, the Mission encourages exploratory visits of scientists, organisation of joint workshops and conferences and joint research projects.

The Mission is also planning to facilitate access to sophisticated research facilities abroad, establish joint centres of excellence and forge academia-industry partnerships at the international level wherever required and desirable, Asthana said."

16. Though it was stated in February 2010, but as yet there is no sign of such a regulatory board. Simply denying inclusion of nanomaterials in the EIA process based on an outdated list appended to EIA Notification 2006 is completely illegal and contrary of the mandate given under EP Act and the Constitution of India.

Nano Materials regulation in USA & EU :

17. That after the direction of this Hon'ble Tribunal, Interveners held a personal communication from Prof Sheela Sathyanarayana, a member of U.S. Environmental Protection Agency's Scientific Advisory Board for the Toxics Substances Control Act says "For an environmental assessment, projects in the US require an environmental impact assessment which can be quite thorough if done well."

In USA, nanomaterials are regulated under **Toxic Substances Control Act (TSCA) by EPA**. FDA regulates nanomaterials in food and medicine.

EU regulates nanomaterials under EIA Directive 2014 and REACH. "The EU's regulatory framework generally covers nanomaterials. Legislation on specific products (Cosmetic Products, Novel Foods, Biocidal Products, Medical Devices) address nanomaterials, including requirements for information on nanomaterials (labelling) and assessment of the safety of these materials. **Other regulations implicitly apply to nanomaterials,**

e.g., the chemicals regulation REACH, as the regulations addresses all chemicals including nanomaterials."

18. That all EU nations follow Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) regulation. It requires the proponent to submit information under the following categories.

- Substance identification
- All the unique compositions provided by the registrants
- Identities of registrants / suppliers and year of last update
- Non-confidential registration numbers
- Contact persons responsible for the safety data sheet
- Classification and labelling and PBT assessment
- Manufacture, use and exposure
- Physical and Chemical properties
- Environmental fate and pathways
- Ecotoxicological information
- Toxicological information
- Analytical methods
- Guidance on safe use
- Indication whether an assessment report has been provided
- Details on reference substances
- Indication of the category(ies) to which a substance can belong

Under REACH, nano calcium carbonate is registered as conventional chemical calcium carbonate with a suffix nanoform.

OECD countries have also developed considerable documentation on regulation and standards for nanomaterials.

19. It is humbly submitted that the Interveners concern is that the MoEF & CC and the state PCBs have no human resources or standards to deal with nanomaterial manufacturing facilities. The CFE issued to M/s Shantiram does not specify the standard limit for monitoring the nanoparticles in the workplace or ambient air. APPCB or Director of

Factories, AP have no capacity as of now to monitor a nanomaterial plant to check for any violation of air pollution limit.

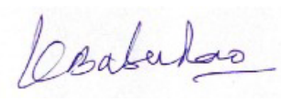
20. That the EIA process is the only route available for regulation of nanomaterials in our country presently. That is the only way to provide an opportunity to stakeholders to present their concerns. An important class of materials with very limited knowledge on its impacts on human health and environment is left out of regulation abandoning the obligation to ensure that potential risks are adequately understood to protect human health and the environment. That the Hon'ble Supreme Court of India time and again cautioned that precautionary principal must be adopted to protect the environment and right to life of the citizens. That ***"the precautionary principle requires that, if there is a strong suspicion that a certain activity may have environmentally harmful consequences, it is better to control that activity now rather than to wait for incontrovertible scientific evidence. This principle is expressed in the Rio Declaration, which stipulates that, where there are "threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation."*** *" In the United States the precautionary principle was incorporated into the design of habitat-conservation plans required under the aegis of the Endangered Species Act. In 1989 the EC invoked the precautionary principle when it banned the importation of U.S. hormone-fed beef, and in 2000 the organization adopted the principle as a "full-fledged and general principle of international law." In 1999 Australia and New Zealand invoked the precautionary principle in their suit against Japan for its alleged overfishing of southern bluefin tuna."*

21. In view of the above, it is submitted that :

- Unfortunately, MoEF&CC is acting with institutional malfeasance to deny inclusion of nanomaterials under EIA Notification 2006, instead of fulfilling its assigned role/statutory mandate under Environment Protection Act and Constitution of India to protect people and environment.

- Leaving out an important class of material that is highly regulated in the world from the EIA notification, especially when there is no other regulatory body for nanomaterials, is an example of environmental injustice.

22. That the Interveners humbly pray the Hon'ble Tribunal to direct the Union Ministry of Environment, Forest & CC to amend the EIA Notification 2006 to include nanomaterials under Red category industries requiring which mandates EIA and public hearing. That the MoEF shall not act piecemeal manner and it should adopt all the international standards required to monitor such sensitive projects.



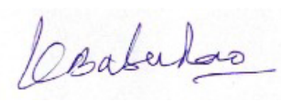
Dr K Babu Rao

Dr A V Rao

DEPONENTS

VERIFICATION:-

Verified on this the 26th day of October, 2021 that the contents of the above affidavit are true and correct. No part of it is false and nothing material has been concealed therefrom.



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Media Release

NanoMaterials Technology Signs Agreement with Santhiram Chemicals (P) Ltd to Supply Technology and Equipment for Manufacturing Nano-precipitated Calcium Carbonate

Singapore, Nov 25, 2015 – NanoMaterials Technology Private Limited ("**NMT**") announced today that it has signed a technology licensing agreement with Santhiram Chemicals (P) Ltd (India) for the use of its proprietary High Gravity Controlled Precipitation ("**HGCP**") Technology to manufacture, market and distribute nano precipitated calcium carbonate ("**NPCC**") in India.

NPCC is a functional additive in a wide range of applications such as paper, rubber, plastics, architectural materials, coatings, adhesives, Sealant, printing ink and light chemicals.

Under the terms of the agreement, **NMT** will supply both **HGCP** technology and reactor to Santhiram in Andhra Pradesh, India. **NMT** will also provide technical and application support to Santhiram India during the marketing of **NPCC** in India. The new **NPCC** plant has a capacity of 20 thousand tons per year and will be in operation in 2017.

In an earlier announcement this year, Singapore will help design and develop a world-class city area in Andhra Pradesh in one of its most ambitious urban planning ventures to date. The city, which will sprout across an area where 17 villages currently sit, will serve as the new capital of Andhra Pradesh, whose Chief Minister has tried to make the state an IT hub.

Andhra Pradesh lost current capital Hyderabad after the province was split in 2014. It has asked Singapore to help it build a spanking new one 7,325 sq km of a state capital region. **NMT** is pleased to be one of the first Singapore Company since the announcement to ride on the strong ties between Andhra Pradesh and Singapore to work with Santhiram on this new business cooperation.

About NanoMaterials Technology Pte Ltd (http://www.nanomt.com)

*Founded in April 2000, NanoMaterials Technology (**NMT**) is a Singapore company that specializes in the development and commercialization of the production technologies of nano-materials. NMT has a proprietary technology called High Gravity Controlled Precipitation (**HGCP**). The Technology is versatile to be coupled with proprietary dispersion technology and know how to improve the dispensability of the nano-particles. It is one of the leading technologies which can produce highly clear and transparent nanosized zinc oxide and other metal oxides dispersion at very high solid content commercially. These metal oxide dispersion are currently being marketed worldwide under Nano-D™ product series.*

About Santhiram Chemicals (P) Ltd

*Santhiram Chemicals (P) Ltd is located in Kurnool district, Andhra Pradesh, Republic of India. It aims to be the top manufacturers of nano- precipitated calcium carbonate (**NPCC**) in India. Santhiram group has established businesses including education, healthcare, solar power and others.*

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Ms Valerie Wu
Email: jingyuan.wu@nanomt.com
Website: www.nanomt.com

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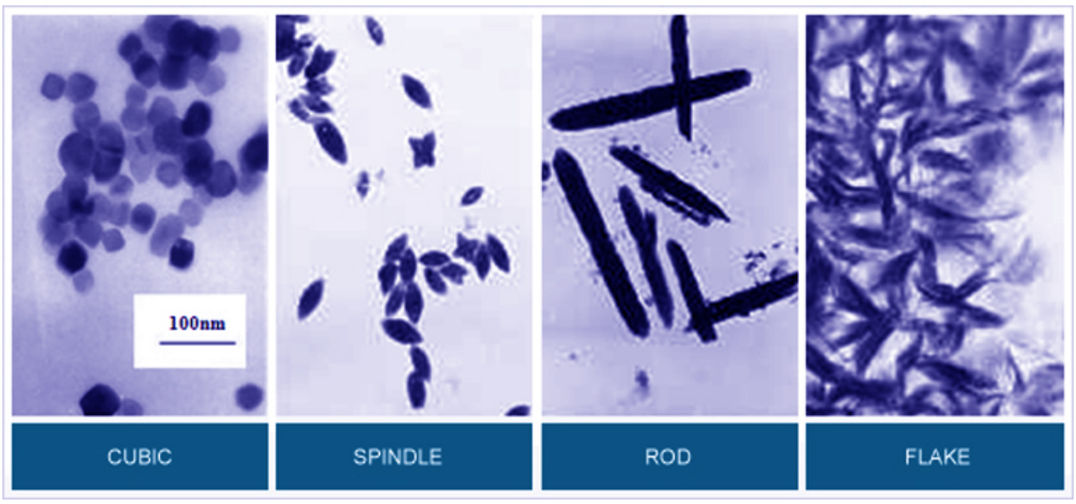
Nano Precipitated Calcium Carbonate (NPCC)

Nano Precipitated Calcium Carbonate (NPCC) is the first nano-material developed by NanoMaterials Technology (NMT). NPCC has been successfully commercialized and its HGCP production technology has been out-licensed to worldwide partners with typical annual manufacturing output of tens of thousand tons. NPCC is also marketing and distributing the NPCC products.

In conventional precipitation technologies, producing nano-particles of calcium carbonate with mean size of less than 100 nm could be challenging without any additives. However, HGCP technology can realize mass production of NPCC nano-particles which precisely controlled at mean size of 15 to 60 nm, without any crystal growth inhibitor. Furthermore, the morphology of NPCC nano-particle can be tailored according to its intended application.



Typical commercial ultra-fine NPCC produced by HGCP technology has the below properties:

- Cubic shape
- Average particle size of 40 nm
- Narrow particle size distribution of ± 15nm
- BET surface area >40 m 2/g
- No chemical inhibitor (no contamination)

NPCC products have been found to be effective functional additives/fillers in plastics, paper, paint, ink, rubber, and many other industries. It can partially replace TiO 2 in many applications, while maintaining the desired functionality properties of TiO 2, such as the hiding power, whiteness and finish. In other applications, NPCC can be used as a partial or complete replacement of conventional fillers – such as fumed silica, carbon black (thermal or normal), etc. in order to improve on the physical and mechanical properties of the product. NPCC products with various surface-modifications are also available to promote smooth integration and compatibility of the NPCC nano-particles into the formulation of your products.

NMT offers various NPCC products (please refer our **Product Information Centre** for our Technical Data Sheet and MSDS) and welcomes Partner who is interested in licensing our production technology (please send your enquiry).

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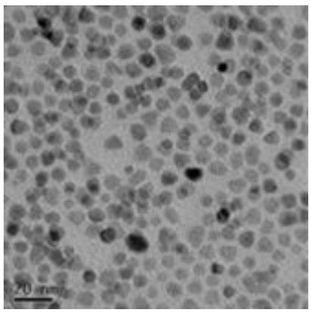
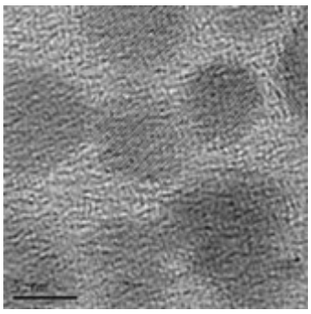
Nano-D Zinc Oxide (ZnO) dispersion

Zinc Oxide is a white inorganic compound which is not readily dissolved in both water and solvents. With HGCP technology, **Nano-D Zinc Oxide (ZnO)** nano-particles can be dispersed in water and various solvents to achieve a highly transparent, stable and very high solid loading (50% or above) mono-dispersion.

TEM of Nano-D ZnO nano-particles

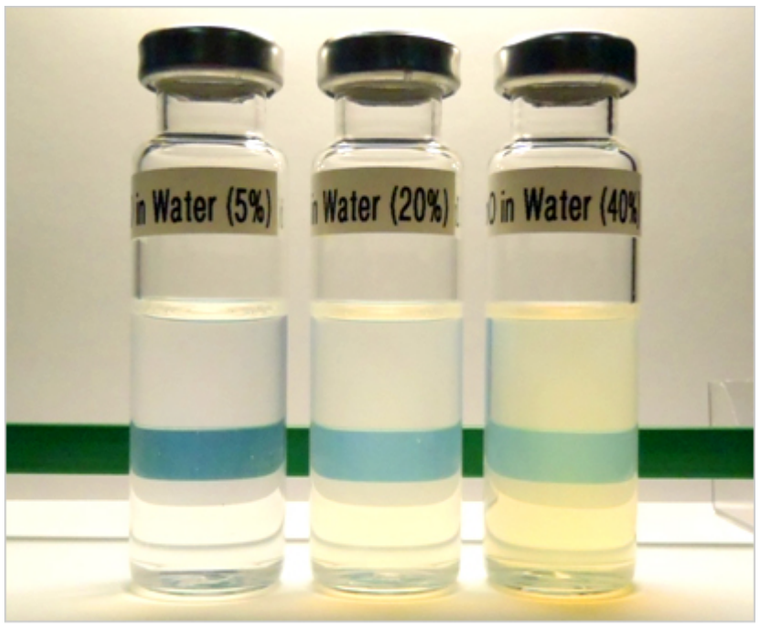




Nano-D ZnO dispersions are now available in various commonly used organic solvents such as toluene, ethanol, MEK, butyl acetate, ethyl acetate, and it is also available in aqueous form. Loading ranges from 30% to 50% depending on media selection. The product is also available for certain dispersing system in crystal powder form for easy and cost effective transportation.

Zinc Oxide in Water, Ethanol, Hexane and Base oil dispersion respectively.

17

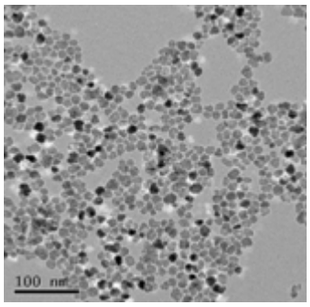


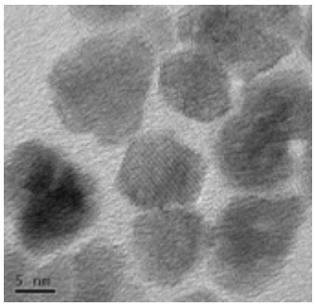
Zinc Oxide dispersion in water in different loading

Nano-D Cerium Oxide (CeO_2) dispersion

Nano-D Cerium Oxide nano-particles is a product derived from patented HGCP Technology coupled with proprietary dispersion technology. **Nano-D Cerium Oxide** nano-particles have minimal agglomeration with very narrow particle size distribution. **Nano-D Cerium Oxide** dispersion is highly transparent even at very high concentration (up to 50 wt%).

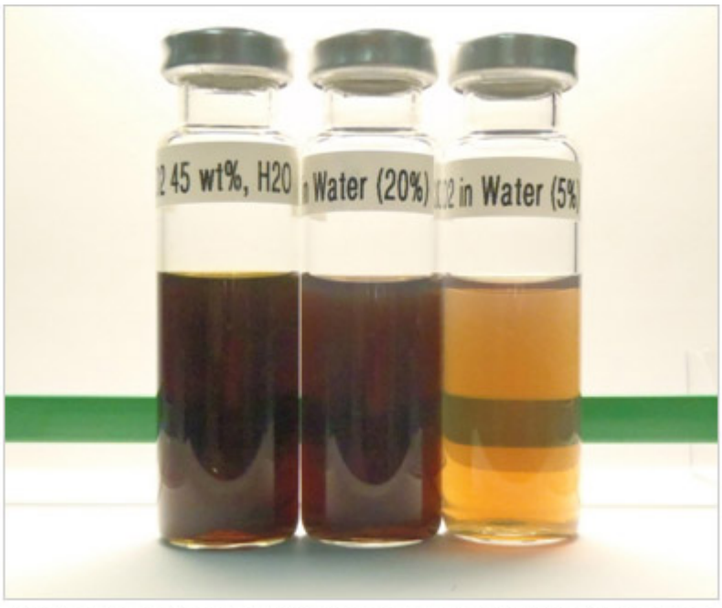
TEM of Nano-D Cerium Oxide nano-particles





Nano-D Cerium Oxide nano-particles are available in dispersion, concentrate or crystal powder form. The solid loading ranges from 30% to 50% depending on media selection. The dispersion/concentrate form can be used directly into the formulation of the product.

Nano-D Cerium Oxide dispersions at various organic solvent



Nano-D Cerium Oxide dispersions at various solid loading in aqueous solvent

Nano-D Antimony Tin Oxide (ATO) dispersion

Nano-D Antimony Tin Oxide (ATO) nano-particles are derived from our patented HGCP Technology coupled with proprietary dispersion technology. ATO dispersion is highly transparent with high solid content of up to 40wt%. **Nano-D ATO** nano-particles have minimal agglomeration with very narrow particle size distribution. The mean particle size in the dispersion is below 100nm (using Dynamic Light Scattering).

IN THE HIGH COURT OF KERALA AT ERNAKULAM

PRESENT

THE HONOURABLE MR. JUSTICE K.ABRAHAM MATHEW

FRIDAY ,THE 07TH DAY OF DECEMBER 2018 / 16TH AGRAHAYANA, 1940

Crl.Rev.Pet.No. 560 of 2018

AGAINST THE ORDER IN CC 296/2018 of JUDICIAL FIRST CLASS MAGIST. COURT, CHOTTANIKKARA(TEMPORARY)

REVISION PETITIONER/ACCUSED 1 & 3 :-

1 **M/S. PHILIPS CARBON BLACK LIMITED 31, NETAJI SUBHASH ROAD, CALCUTTA - 700 001WITH UNIT OFFICE AT 39/137 A, KRISHNA SWAMI CROSS ROAD,COCHIN - 682 035 REPRESENTED BY ITS AUTHORISED REPRESENTATIVE NANDAGOPAL G.,S/O.K.GOPALAKRISHNAN NAIR, AGED 43 YEARS.**

2 **V.R.MENON MANAGER (POLUTION CONTROL) (RETIRED),AGED 62 YEARS, M/S. PHILIPS CARBON BLACK LIMITED, KARIMUGHAL, BRAHMAPURAM P.O., KOCHI - 682 303,NOW RESIDING AT 'THEJUS', VARDIUM,THRISSUR - 680 547.**

BY ADVS.
SRI.S.SREEKUMAR (SR.)
SRI.P.PRIJITH
SRI.THOMAS P.KURUVILLA

RESPONDENTS/COMPLAINANT & ACCUSED NO.2 :-

1 **SABU THOZHUPADAN S/O. KURUVILLA, AGED 43 YEARS,RESIDING AT THOZHUPPADAN HOUSE,KARIMUGAL, PUTHENCRUZ VILLAGE,KUNNATHUNADU TALUK, ERNAKULAM.**

2 **ROY CHOWDHURY RABISWAR ROY CHOWDHURY AGED 77 YEARS, FORMER CHIEF EXECUTIVE ENVIRONMENT,M/S.PHILIPS CARBON BLACK LTD.,KRISHNA SWAMI CROSS ROAD, COCHIN - 682 035.,NOW RESIDING AT SUNNY VDIEW, FLAT NO.102,61R, SUREN SARKAR ROAD, BELIAGHATA, KOLKATA - 700 010.**

3 **THE STATE OF KERALA REPRESENTED BY PUBLIC PROSECUTOR,HIGH COURT OF KERALA, ERNAKULAM - 682 031.**

BY ADVS.
SRI.E.M.ABDUL KHADER
SMT.AMRIN FATHIMA
SMT.M.A.VAHEEDA BABU
SRI.BABU KARUKAPADATH
SRI.K.M.FAISAL (KALAMASSERY)
SRI.MITHUN BABY JOHN
SRI.P.U.VINOD KUMAR
SRI.RAHUL ROY
R3 BY SRI. C.S. HRITHWIK, SR PUBLIC PROSECUTOR

THIS CRIMINAL REVISION PETITION HAVING BEEN FINALLY HEARD ON 07.12.2018, THE COURT ON THE SAME DAY PASSED THE FOLLOWING:

ORDER

The first petitioner is a limited company. The second petitioner and the second respondent were its Manager (Pollution Control) and Chief Executive (Environment) respectively. The company had two manufacturing units (Line I and II). The first respondent filed a complaint before the Judicial Magistrate concerned, which is now pending as C.C.No.296 of 2018 in the court of Judicial Magistrate of First Class, Chottanikkara. One of the allegations is that the company caused pollution in the area and it failed to comply with the direction of the Pollution Control Board to close down the units. The other allegation is that without obtaining the sanction of the Pollution Control Board the company established and operated a third unit (Line III). After complying with the direction given in the Crl.R.P No.293 of 2014 the learned Magistrate passed Annexure-B order holding that there are no sufficient grounds to discharge

petitioners and the second respondent and a charge has to be framed against them for the offence under section 37 of the Air (Prevention of Control and Pollution Act, 1981). This order is challenged.

2. Heard the learned senior counsel appearing for the petitioners and the learned counsel appearing for the first respondent, and the learned Public Prosecutor.

3. Evidence of the first respondent was recorded under section 244 (1) Cr.P.C. PW1 to PW5 were examined and Exhibits X1 to X5 were marked on the part of the first respondent. Exhibits D1 to D9 were marked on the part of the petitioners and the second respondent before the learned Magistrate decided to frame charge against the petitioners and the second respondent.

4. Section 244 Cr.P.C does not contemplate adducing defence evidence. Accused shall not be allowed to adduce evidence at this stage. But documents were marked for the petitioners and

second respondent only because this court by the order passed in Crl.R.P.No. 293 of 2014 allowed them to "produce all the materials, including the consent obtained from the Board". Ordinarily, defence evidence cannot be looked into by the learned Magistrate to decide whether charge should be framed or not.

5. The first petitioner company had initially two manufacturing units. They allegedly emitted and discharged effluent which caused pollution in an extensive area. On 07.04.2001 the Member Secretary of the Kerala State Pollution Control Board directed the company to take certain action by Annexure R1(e) letter. The following six facts were noted by the Pollution Control Board.

1. **A major expansion work is in progress without clearance from the Board.**
2. **There is severe air pollution caused from the Unit.**
3. **The major source of air pollution is fugitive emissions.**
4. **There is leakage of carbon particles from various units and leaked material is accumulated**

at many places and/or spread all over both within and outside the plant.

5. Packing area, loading bay, warehouse etc need special mention in this regard.

6. The roads around the plant are not tarred or concreted. These are not wetted also as per the consent condition. As a result the dust pollution from the roads especially during truck movements is severe.

6. There was a proposal for expansion of the manufacturing units of the company. It apparently applied for the consent of the Pollution Control Board on 30.06.2001. By Annexure R1(i) order the Board informed the company of its refusal to give consent to establish a new unit (Unit III- called Line III).

7. Annexure R1(c) indicates that inspite of the stop order and the refusal of the Board to give consent to establish a new unit, the company commissioned and operated a new unit. The Member Secretary reported that the company violated the direction issued to it and it continued to pollute the air.

8. On 21.07.2001 the Pollution Control Board issued Annexure-R1(b) directions to the company to close down the operations in the manufacturing units as the operations were being done inspite of the refusal of the Board to issue consent to establish a new unit. On 27.07.2001 the Board informed the company again to close down the units.

9. Genuineness of the above documents is not disputed. The documents speak for themselves. It is also pertinent to note that the petitioners have no case that they had obtained consent of the Pollution Control Board before the 3rd unit was established.

10. The learned Senior counsel appearing for the petitioners would submit that the consent of the Pollution Control Board was obtained later. This was the argument before the trial court also. The trial court took the view that obtaining consent subsequent to the commission of the offence would not erase the offence. It took the

view that not only for starting the operations but to establish the unit itself previous consent of the Pollution Control Board was necessary.

11. Section 21(1) of the Air (Prevention & Control of Pollution) Act provides that subject to the provisions in the section no person shall without the previous consent of the State Board establish or operate any industrial plant in an air pollution control area. There is no dispute that the area in which the petitioner company has established its units is an air pollution control area. It is immaterial whether the industrial plant will cause pollution or not. Even if the plant does not cause pollution, consent of the Board is necessary to establish any industrial plant in the area. Not only to operate an industrial unit, but to establish it also previous consent of the Board is necessary.

12. It was not disputed for me that the Unit-III of the petitioner company was established without the consent of the Pollution Control

Board. Though the Pollution Control Board refused to give consent, the petitioner company operated the plant. The subsequent granting of the consent by the Board does not erase or efface the offences already committed by the company and its officers. The learned Magistrate rightly rejected the prayer of the petitioners to discharge them.

In the result, this Crl.R.P is dismissed.

Sd/-

K.ABRAHAM MATHEW
JUDGE

SMA

10

APPENDIX

PETITIONER(S)' ANNEXURES :-

ANNEXURE-A : TRUE COPY OF ORDER IN CRL.R.P.NO.293 OF 2014 DATED 19.02.2018 OF THIS HON'BLE COURT.

ANNEXURE-B : CERTIFIED COPY OF ORDER IN C.C.NO. 296 OF 2018 DATED 23.04.2018 OF JUDICIAL MAGISTRATE OF FIRST CLASS, CHOTTANIKKARA.

RESPONDENTS(S)' ANNEXURES :-

ANNEXURE-R1(a) : TRUE COPY OF COMPLAINT DATED 02.02.2002 IN C.C.NO.105 OF 2002 OF JFCM COURT, KOLENCHERY.

ANNEXURE-R1(b) : TRUE COPY OF ORDER NO. PCB/TVM.AIR/71/84 DATED 21.01.2001 OF POLLUTION CONTROL BOARD.

ANNEXURE-R1(c) : TRUE COPY OF REPORT DATED 19.07.2001 OF MEMBER SECRETARY, POLLUTION CONTROL BOARD.

ANNEXURE-R1(d) : TRUE COPY OF ORDER NO.PCB/AQU/71/84 DATED 27.07.2001 OF POLLUTION CONTROL BOARD.

ANNEXURE-R1(e) : TRUE COPY OF ORDER NO.PCB/AQU/71/84 DATED 07.04.2001 OF POLLUTION CONTROL BOARD.

ANNEXURE-R1(f) : TRUE COPY OF UNDERTAKING DATED 25.07.2001 OF PETITIONER COMPANY TO POLLUTION CONTROL BOARD.

ANNEXURE-R1(g) : TRUE COPY OF LETTER DATED 23.07.2001 OF IST PETITIONER COMPANY TO POLLUTION CONTROL BOARD.

ANNEXURE-R1(h) : TRUE COPY OF ORDER NO.PCB/TVM/AIR/71/84

DATED 25.07.2001 OF POLLUTION CONTROL BOARD.

ANNEXURE-R1(i) : TRUE COPY OF ORDER NO.PCB/CE.EK.290/2001 DATED 30.06.2001 OF POLLUTION CONTROL BOARD.

ANNEXURE-R1(j) : TRUE COPY OF ORDER DATED 24.09.2001 IN O.P.NO.10736/1999 OF THIS HON'BLE COURT.

ANNEXURE-R1(k) : TRUE COPY OF ORDER DATED 14.10.2001 IN O.P.NO.10736/1999 OF THIS HON'BLE COURT.

ANNEXURE-R1(l) : TRUE COPY OF JUDGMENT DATED 15.01.2002 IN O.P.NO. 12959/2001 OF THIS HOB'BLE COURT.

ANNEXURE-R1(m) : TRUE COPY OF ORDER IN CRL.M.C.NO.3608/2002 DATED 01.03.2004 OF THIS HON'BLE COURT.

ANNEXURE-R1(n) : TRUE COPY OF ORDER IN CRL.R.P.NO.3339/2009 DATED 28.03.2011 OF THIS HON'BLE COURT.

ANNEXURE-R1(o) : TRUE COPY OF ORDER IN CRL.R.P.NO.1725/2013 DATED 18.10.2013 OF THIS HON'BLE COURT.

//True Copy//

PA TO JUDGE

SMA

Environmental Impact Assessment

for

Proposed 150000 TPA Carbon Black & 16MW Cogeneration Power Plant

at GIDC-Dahej, Vagra, Bharuch, Gujarat.

Final Report

Submitted to

STATE LEVEL ENVIRONMENTAL IMPACT ASSESSMENT AUTHORITY, Gujarat

Paryavaran Bhavan, Sector-10A, Gandhinagar-382010.

Submitted by

CONTINENTAL CARBON ECO-TECHNOLOGY PVT. LTD.

A-14, Industrial Area No.1, (Off NH-24), South side of G.T. Road,
Post Box No. 56, Ghaziabad – 201 001 (U.P.)

Consultant

Ramky Enviro Services Private Limited

Ramky Grandiose, Gachibowli, Hyderabad - 32

QCI/NABET/EIA/ACO/19/0978

July-2019

S. M. SAIYAD, IFS
MEMBER SECRETARY
SEIAA (GUJARAT)

सत्यमेव जयते

STATE LEVEL ENVIRONMENT IMPACT ASSESSMENT AUTHORITY GUJARAT

Government of Gujarat

By R P A D

No. SEIAA/GUJ/TOR/5(e)/539/2019 Date: 10 APR 2019

Time Limit

Sub: Terms Of Reference to M/s. Continental Carbon Eco Technology Pvt. Ltd. for setting up of 'Petrochemical based processing industry' at Plot No. D 3/22, D2/15, GIDC Dahej, Ta. Vagra, Bharuch.

Ref: Your Proposal No: SIA/GJ/IND2/31666/2019.

Dear Sir,

This has reference to your online application dated 28/01/2019 along with Form-I submitted to SEIAA. The project activity is covered in 5(f) and is of 'B' Category.

The SEAC, Gujarat vide their letter dated 05/03/2019 had recommended to the SEIAA, Gujarat, to grant the Terms Of Reference for the above-mentioned project based on its meeting held on 26/02/2019.

The proposal was considered by SEIAA, Gujarat in its meeting held on 07/03/2019 at Gandhinagar. After careful consideration, the SEIAA hereby accords Terms Of Reference to above project under the provisions of EIA Notification dated 14th September, 2006. The copy of Terms Of Reference is attached herewith.

With regards,
Yours sincerely,

(S. M. SAIYAD)
Member Secretary

Encl: As Above

Issued to:
M/s. Continental Carbon Eco Technology Pvt. Ltd.
M/s. Continental Carbon India Ltd (CCIL),
A-14, Industrial Area No. 1, (Off NH-24),
South Side of G.T. Road, Post Box No. 56,
Ghaziabad- 201001 (U. P.)

State Level Environment Impact Assessment Authority Gujarat
SEIAA

Terms of Reference [ToR] to M/s. Continental Carbon Eco Technology Pvt. Ltd., for setting up of 'Petrochemical based processing Industry' at Plot No-D 3/22 D2/15, GIDC-Dahej, Ta-Vagra, Dist-Bharuch.

Category of the unit: 5(e)
Project status: New

I. This is in reference to proposal no. SIA/GJ/IND2/31666/2019 dated 28/01/2019 regarding grant of Terms of Reference [ToR] for preparation of EIA/EMP report.

II. This is a new Proposed Greenfield project for establishment of Carbon Black manufacturing as tabulated below:

Sr. No.	Name of the Products	Quantity MT/Month	End-use of the products
1	Carbon Black	12500 TPM	Carbon black is added to rubber as both a filler and as a strengthening or reinforcing agent. For various types of tires, it is used in inner liners, carcasses, side walls and treads utilizing different types based on specific performance requirements.
2	16 MW Co-generation Power Plant (WHRPP)	16 MW	A co-generation system is installed to meet the requirement of power and steam for the entire project.

III. The project falls under Category B of project activity 5(e) as per the schedule of EIA Notification 2006.

IV. PP was called for presentation in the SEAC meeting dated 26/02/2019.

V. During the meeting dated 26/02/2019, technical presentation made during the meeting by project proponent.

VI. Salient features of the project are as under:

S. No	Particulars	Details
A		
A	Total cost of Proposed Project (Rs. In Crores):	Rs. 802.87 Crores
B	Total Plot area (sq. meter)	300000 Sq. m
	Green belt area (sq. meter)	104597 Sq. m.
C	Employment generation	400
D	Water	
i	Source of Water Supply (GIDC Bore well, Surface water, Tanker supply etc.)	GIDC water supply
	Status of permission from the concern authority.	-
Ii	Water consumption (KLD)	

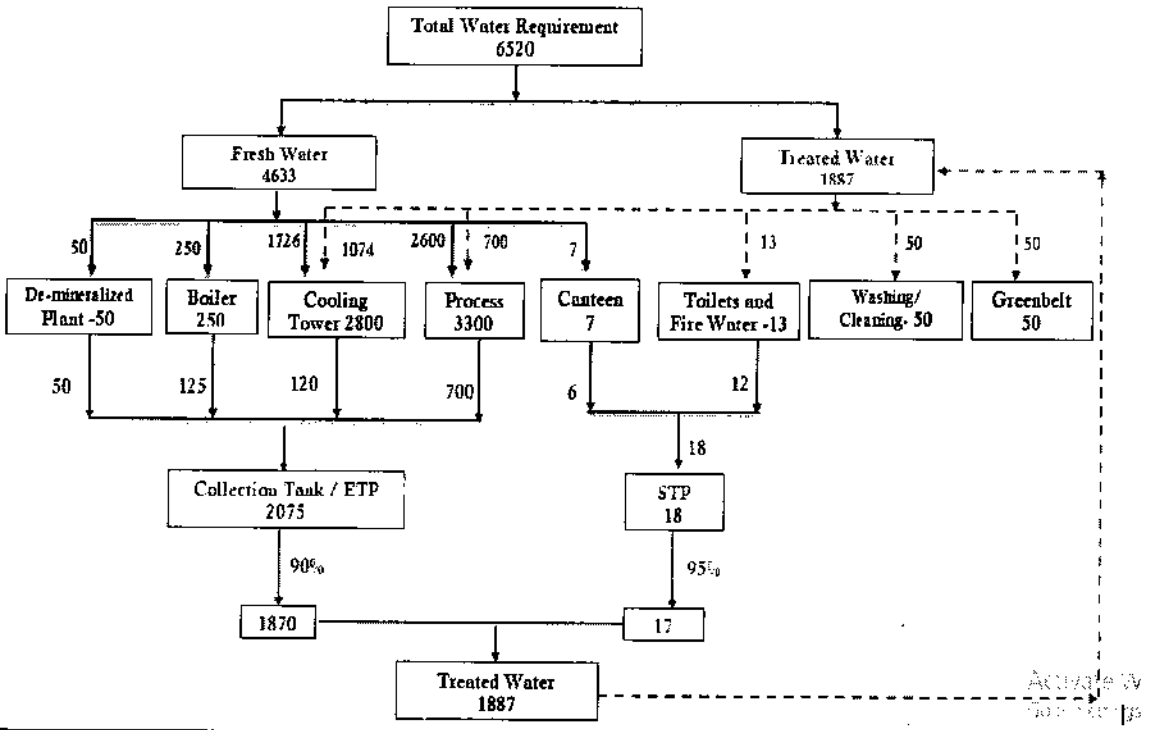
Category	Quantity KLD	Remarks
(A) Domestic	7	Admin Office, Canteen etc...
(B) Gardening	50	Greenbelt
(C) Industrial		
Process	3300	Fresh - 2600 + Treated - 700
Washing	50	Road Washing (Treated water will not use for Road washing)
Boiler	250	
Cooling	2800	
Others	63	(Toilets & Fire-13; DMP-50)
Industrial Total	6463	
Total (A + B + C)	6520	

1) Total water requirement for the project: 6520 KLD
2) Quantity to be recycled: 1887 KLD
3) Total fresh water requirement: 4633 KLD

Iii	Waste water generation (KLD)

Category	Wastewater KLD	Remarks
(A) Domestic	6	Canteen
(B) Industrial		
Process	700	
Boiler	125	
Cooling	1200	
Others	62	DM Plant – 50 + Toilets - 12
Total Industrial wastewater	2087	
Total [A + B]	6 + 2087 = 2093	

Iv	Treatment facility within premises with capacity [In-house ETP (Primary, Secondary, Tertiary), MEE, Stripper, Spray Dryer, STP etc.	In-house ETP capacity – 2075 KLD; STP capacity – 18 KLD, RO/DM Plant, Evaporation Plant. ETP Flow diagram submitted separately.
	Treatment scheme including segregation at source. ➢ Treatment scheme of ETP flow diagram attached.	
	Note: (In case of CETP discharge) : ➢ Not applicable	
	Brief note on adequacy of ZLD (In case of Zero Liquid Discharge): ➢ 1870 KLD treated water reusing for Process purpose only.	
V	Mode of Disposal & Final meeting point	
	Domestic:	After treatment in STP, Reused for toilet flushing etc...
	Industrial:	Treated effluent from ETP will be completely reused in manufacturing process. Hence, unit maintains zero liquid discharge (ZLD).
Vi	In case of Common facility (CF) like CETP, Common Spray dryer, Common MEE etc. Name of CF ➢ Not Applicable	
	Membership of Common facility (CF) (For waste water treatment) ➢ Not Applicable	
Vii	Simplified water balance diagram with reuse / recycle of waste water	



Viii	Reuse/Recycle details (KLD)			
	Total reuse 1887 KLD (1870 KLD + 18 KLD)			
	Source of waste water for reuse with quantity in KLD (From where it is coming)	Application area with quantity in KLD (Where it is used)	Characteristics of waste water to be reused (COD, BOD, TDS etc.)	Remarks regarding feasibility to reuse i.e.
	Water Balance Flow Chart is given.			
	Detailed qualitative analysis will be submitted with EIA report.			

E Air

i Flue gas emission details
No. of Boilers/TFH/Furnaces/DG sets etc. with capacities viz. TPH, Kcal/hr, MT/hr, KVA etc.

S. No.	Source of emission With Capacity	Stack Ht. (m)	Type of Fuel	Quantity of Fuel MT/Day	Type of emissions i.e. Air Pollutants	Air Pollution Control Measures (APCM)
1	Boiler-2 70 TPH each	100 & 2.5	Tail gas	65000 Nm^3/hr	PM SO2, NOx	Stack of Adequate Ht. as per CPCB guidelines
2	DG set (3 No's x approx.. 750 kVA), Stand by	30 & 0.2	HSD	170 L/hr		Common Stack of adequate Ht. as per CPCB guidelines

ii Process gas emission details i.e. Type of pollutant gases (SO_2, HCl, NH_3, Cl_2, NO_x etc.)

Source of Emission		Type of emission	Stack Ht. & Dia. (m)	Air pollution Control Measures
Boiler stack-1	WHR Boiler	PM	100 & 1.82	Bag filter
Boiler stack-2	WHR Boiler		100 & 1.82	Bag filter
Exhaust Bag Filter-1	Process Plant		50 & 1.2	Bag filter
Exhaust Bag Filter-2	Process Plant		50 & 1.2	Bag filter
Exhaust Bag Filter-3	Process Plant		50 & 1.2	Bag filter
Exhaust Bag Filter-4	Process Plant		50 & 1.2	Bag filter

iii Fugitive emission details with its mitigation measures:
There will be a chance of fugitive emission during manufacturing process as well as due to storage and handling of raw materials and products. The unit will take following precaution for the control of fugitive emission

Probable Sources	Control Measures
Manufacturing activities	• All equipments are maintained regularly along with checking of flange and welded joints. • All raw materials and end products are properly metered so that there is no possibility of overloading. • Proper safety interlocks are incorporated. • Bulk transportation within the process is done by closed bucket elevator and screw conveyer
Emission from Carbon black storage tank and packing	• Dedusting system with proper bag filters provided. All storage tanks are closed with proper venting system and level is checked regularly without overfilling.
Pump and compressor Emissions	• Mechanical seals are provided in pumps and agitators • Standby arrangement for critical equipment for periodic maintenance
Valves, Flanges, plugs and instrument connections	• Welded pipes are used wherever feasible. • Suitable gasket materials are used. • Suitable glad packing is used in valves. • Periodic inspection and maintenance of pipes and pipe fittings is carried out.

F Hazardous wastes
(As per the Hazardous and Other Wastes (Management and Transboundary Movement) Rules 2016.

I

S. No.	Type/Name of Hazardous waste	Specific Source of generation (Name of the Activity, Product etc.)	Category &Schedule as per HW Rules.	Quantity (MTPA)	Management of HW
1	Discarded filter medium (Bag Filters)	Process Plant	Sch-1, 36.2	44	Collection, Storage, Transportation and Disposal at TSDF-BEIL
2	Ceramic Wool/Waste insulation Material	Process Plant	Sch-1, 33.1	24	Collection, Storage, Transportation and Disposal at TSDF

	3	Used oily cotton waste/wether hand gloves/cotton hand gloves	Plant & Machinery	Sch-1, 33.2	7	Collection, Storage, Transportation and Disposal at TSDF-BEIL
	4	Used Oil/Spent Oil	Plant & Machinery	Sch-1, 5.1	8	Reprocessed & reuse/disposal by selling to registered refiners.
	5	Chemical Sludge	ETP Plant	Sch-1, 35.3	150	Collection, Storage, Transportation and Disposal at TSDF-BEIL
	6	Evaporation Plant Sludge(MEE Salt)	Evaporation Plant	Sch-1, 35.3	2738	Collection, Storage, Transportation and Disposal at TSDF-BEIL
	7	Spent Ion Exchange Resin	DM Plant	Sch-1, 35.3	1.8	Collection, Storage, Transportation and Disposal at TSDF-BEIL by incineration.
	8	Discorded Containers/barrels/liners/waste plastic bags	Raw material & storage & handling	Sch-1, 33.1	18	Collection, storage, decontamination, transportation and disposal to registered reuses

ii	Membership details of TSDF, CHWIF etc. (For HW management)	Unit will be obtained membership from BEIL for disposal of hazardous waste. The process is in progress.
iii	Details of Non-Hazardous waste & its disposal (MSW and others)	Solid waste generation details are attached as Annexure -4
G	Solvent management, VOC emissions etc.	
i	Types of solvents, Details of Solvent recovery, % recovery, reuse of recovered Solvents etc.	
	➢ Solvent use in process is not anticipated.	
ii	VOC emission sources and its mitigation measures	
	➢ Adequate numbers of smoke detectors and VOC detectors will be provided and mentioned in section E (iii) above.	

VII. Referring to the amended EIA Notification vide S.O. 1599(E) dated 25/06/2014 Committee noted that "thermal power plants using waste heat boilers without any auxiliary fuel are exempt from Environment Clearance". Hence, Category 1(d) for setting up of Captive power plant of 16 MW without auxiliary fuel is not applicable in the instant case.

VIII. Considering the above project details, the terms of reference (ToR) are prescribed as below and for the EIA study to be done covering 10 Km radial distance from the project boundary.

1. Executive summary of the project – giving a prima facie idea of the objectives of the proposal, use of resources, justification, etc. In addition, it should provide a compilation of EIA report, including EMP and the post-project monitoring plan in brief.
2. PP shall furnish status of all the applicable rules, acts, regulation, clearances in a tabular form.
3. Copy of plot holding certificate obtained from GIDC Authority.
4. Present land use pattern of the study area shall be given based on satellite imagery.
5. Layout plan of the factory premises. (Show all the production plants including Raw material & Products storage area). Provision of separate entry & exit and adequate margin all round the periphery for unobstructed easy movement of the emergency vehicle / fire tenders without reversing back. Mark the same in the plant layout.
6. Technical details of the plant/s along with details on best available technologies (BAT), proposed technology and reasons for selecting the same.
7. Details on requirement of raw materials, its source and storage at the plant.
8. Details of manufacturing process / operations of each product along with chemical reactions, mass balance, consumption of raw materials etc. Details on strategy for the implementation of cleaner production activities.
9. Full name and chemical formula of all the raw materials and products. Details on end use of each product.

10. Complete management plan for By-products to be generated, along with the name and address of end consumers to whom the by-product/s will be sold. Copies of agreement / MoU / letter of intent from them, showing their willingness to purchase said by-products/Spent acids from the proposed project.
11. Detailed mass balance and water balance (including reuse-recycle, if any) along with qualitative and quantitative analysis of the each waste stream from the processes.
12. Assessment of source of the water supply with adequacy of the same to meet with the requirements for the project. Permission obtained from the GIDC for supply of raw water. Undertaking stating that no bore well shall be dug within the premises.
13. Explore the possibility of reuse / recycle and other cleaner production options for reduction of wastes. Details of methods to be adopted for the water conservation.
14. Qualitative and quantitative analysis of waste water to be generated from the manufacturing process of each product to be manufactured along with mass balance.
15. Segregation of waste streams and details on specific treatment and disposal of each stream.
16. Action plan for 'Zero' discharge of effluent shall be included. Notarized undertaking for assuring that underground drainage connection will not be taken in the unit.
17. Details of ETP including dimensions of each unit along with schematic flow diagram. Inlet, transitional and treated effluent qualities with specific efficiency of each treatment unit in reduction in respect of all concerned/regulated environmental parameters. Inlet effluent quality should be based on worst case scenario considering production of most polluting products that can be manufactured in the plant concurrently.
18. Treatability & adequacy report for proposed effluent treatment scheme. Feasibility report for reuse of RO permeates & MEE condensate waste water for industrial purpose within premises.
19. Undertaking stating that a separate electric meter will be provided for the ETP system.
20. Proposal to provide and maintain separate electric meter, operational logbook for effluent treatment systems, online meters for monitoring of flow, pH, TOC/COD, etc.
21. Application wise break-up of effluent quantity to be recycled / reused in various applications like sprinkling for dust control and green belt development etc. In case of land application, details on availability of sufficient open land for utilizing effluent for plantation / gardening. How it will be ensured that treated effluent won't flow outside the premises linked with storm water during high rainy days.
22. Details regarding infrastructure facilities such as sanitation, fuel storage, restroom, etc., to the workers during construction and operation phase.
23. Detailed process description when steam generation does not exist and flaring of flue gas for Carbon Black plant.
24. Leak Detection and Repairing Programme (LDAR) for all the volatile organic solvent proposed for use in-house with detailed chemical properties including vapor pressure. LDAR shall endeavor prevention of losses of solvents to the best minimum extent.
25. Details of proposed layout clearly demarcating various facilities/units within the plant. Complete process flow diagram describing each unit, its processes and operations, along with material and energy inputs and outputs (material balance) for production of petrochemical based products.
26. Details of proposed source-specific pollution control schemes and equipments to meet the national standards.
27. One season Site-specific micro-meteorological data using temperature, relative humidity, hourly wind speed and direction and rainfall should be incorporated.
28. Anticipated environmental impacts due to the proposed project/production may be evaluated for significance and based on corresponding likely impacts VECs (Valued Environmental Components) may be identified. Baseline studies may be conducted within the study area of 10 km for all the concerned/identified VECs and likely impacts will have to be assessed for their magnitude in order to identify mitigation measures.
29. While identifying the likely impacts, also include the following for analysis of significance and required mitigation measures:
    - Impacts due to transportation of raw materials and end products on the surrounding environment
    - Impacts on surface water, soil and groundwater

- Impacts due to air pollution
- Impacts due to odour pollution
- Impacts due to noise
- Impacts due to fugitive emissions
- Impact on health of workers due to proposed project activities

30. One complete season base line ambient air quality data (except monsoon) to be given along with the dates of monitoring. The parameters to be covered shall be in accordance with the revised National Ambient Air Quality Standards as well as project specific parameters. Locations of the monitoring stations should be so decided so as to take into consideration the pre-dominant downwind direction, population zone and sensitive receptors. There should be at least one monitoring station in the upwind direction. There should be at least one monitoring station in the pre dominant downwind direction at a location where maximum ground level concentration is likely to occur.
31. Modeling indicating the likely impact on ambient air quality due to proposed activities. The details of model used and input parameters used for modeling should be provided. The air quality contours may be shown on location map clearly indicating the location of sensitive receptors, if any, and the habitation. The wind rose showing pre-dominant wind direction should also be indicated on the map. Impact due to vehicular movement shall also be included into the prediction using suitable model. Results of Air dispersion modeling should be superimposed on satellite Image / geographical area map.
32. Base line status of the noise environment, impact of noise on present environment due to the project and proposed measures for noise reduction including engineering controls.
33. Specific details of (i) Process gas emission from each unit process with its quantification, (ii) Air pollution Control Measures proposed for process gas emission, (iii) Adequacy of the air pollution control measures for process gas emission, measures to achieve the GPCB norms (iv) Details of the utilities required (v) Type and quantity of fuel to be used for each utility (vi) Flue gas emission rate from each utility (vii) Air Pollution Control Measures proposed to each of the utility along with its adequacy (viii) List the sources of fugitive emission along with its quantification and proposed measures to control it.
34. Details on VOC balance including point sources, fugitive emissions, flare management, etc.
35. Details on requirement of energy along with its source and availability.
36. Action plan to control Odor from the project activities as per the prevailing Guidelines published by CPCB/MoEF&CC.
37. Details on management of the hazardous wastes to be generated from the project stating detail of storage area for each type of waste, its handling, its utilization and disposal etc. How the manual handling of the hazardous wastes will be minimized. Methodology of de-contamination and disposal of discarded containers and its record keeping.
38. Explore the possibilities for Hazardous waste to send for co-processing before sending to TSDF site and CHWIF.
39. Membership of Common Environmental Infrastructure including the TSDF / Common Incineration Facility, if any.
40. A detailed EMP including the protection and mitigation measures for impact on human health and environment as well as detailed monitoring plan and environmental management cell proposed for implementation and monitoring of EMP. The EMP should also include the concept of waste-minimization, recycle/reuse/recover techniques, energy conservation, and natural resource conservation. Total capital cost and recurring cost/annum earmarked for environment pollution control measures.
41. Environmental monitoring program
    - Monitoring programme for pollution control at source.
    - Monitoring pollutants at receiving environment for the appropriate notified parameters – air quality, groundwater, surface water, gas quality, etc. during operational phase of the project.
    - Specific programme to monitor safety and health protection of workers.
    - Monitoring of carbon foot print.

- Appropriate monitoring network has to be designed and proposed, to assess the possible residual impacts on VECs.
- Details of in-house monitoring capabilities and the recognized agencies if proposed for conducting monitoring.

42. Environmental management plan
    - Administrative and technical organizational structure to ensure proposed post-project monitoring programme for approved mitigation measures.
    - EMP devised to mitigate the adverse impacts of the project should be provided along with item-wise cost of its implementation (capital and recurring costs).
    - Mitigation measures and EMP for construction work camps and slums formed during construction and operation including other induced developments.
    - Allocation of resources and responsibilities for plan implementation.
    - Details of the emergency preparedness plan and on-site and off-site disaster management plan.
43. Permission from PESO, Nagpur for storage of solvents, other toxic chemicals, if any.
44. Occupational health impacts on the workers and mitigation measures proposed to avoid the human health hazards along with the personal protective equipment to be provided. Provision of industrial hygienist and monitoring of the occupational injury to workers as well as impact on the workers. Plan for periodic medical checkup of the workers exposed. Details of work place ambient air quality monitoring plan as per Gujarat Factories Rules.
45. Risk assessment including prediction of the worst-case scenario and maximum credible accident scenarios should be carried out. The worst-case scenario should take into account the maximum inventory of storage at site at any point of time. The risk contours should be plotted on the plant layout map clearly showing which of the facilities would be affected in case of an accident taking place. Based on the same, proposed safeguard measures including On-Site / Off-Site Emergency Plan should be provided.
46. MSDS of all the products and raw materials.
47. Details of hazardous characteristics and toxicity of raw materials and products to be handled and the control measures proposed to ensure safety and avoid the human health impacts. This shall include the details of Antidotes also.
48. Details of quantity of each hazardous chemical (including solvents) to be stored, Material of Construction of major hazardous chemical storage tanks, dyke details, threshold storage quantity as per schedules of the Manufacture, Storage &Import of Hazardous Chemicals Rules of major hazardous chemicals, size of the biggest storage tank to be provided for each raw material & product etc. How the manual handling of the hazardous chemicals will be minimized?
49. Details of the separate isolated storage area for flammable chemicals. Details of flame proof electrical fittings, DCP extinguishers and other safety measures proposed. Detailed fire control plan for flammable substances and processes showing hydrant pipeline network, provision of DG Sets, fire pumps, jockey pump, toxic gas detectors etc.
50. Submit checklist in the form of Do's & Don'ts of preventive maintenance, strengthening of HSE, manufacturing utility staff for safety related measures.
51. Detailed five year greenbelt development program including annual budget, types & number of trees to be planted, area under green belt development [with map], budgetary outlay; along with commitment of the management to carry out the tree plantation activities outside the premises at appropriate places in the nearby areas and elsewhere.
52. Detailed socio-economic development measures including community welfare program most useful in the project area for the overall improvement of the environment. Submit a detailed plan for social corporate responsibilities, with appropriate budgetary provisions for the next five years and activities proposed to be carried out; specific to the current demographic status of the area.
53. Compliance of MoEFCC's OM dated 01/05/2018 regarding "Corporate Environment Responsibility" (CER). Fund allocation for Corporate Environment Responsibility (CER) shall be made as per MoEFCC's O.M. No.

22-65/2017-IA.III dated 01/05/2018 for various activities therein. The details of fund allocation and activities for CER shall be incorporated in EIA/EMP report.

54. (a) Does the company have a well laid down Environment Policy approved by its Board of Directors? If so, it may be detailed in the EIA report. (b). Does the Environment Policy prescribe for standard operating process / procedures to bring into focus any infringement / deviation / violation of the environmental or forest norms / conditions ? If so, it may be detailed in the EIA.
55. What is the hierarchical system or administrative order of the company to deal with the environmental issues and for ensuring compliance with the EC conditions. Details of this system may be given.
56. Does the company have a system of reporting of non compliances / violations of environmental norms to the Board of Directors of the company and / or shareholders or stakeholders at large? This reporting mechanism should be detailed in the EIA Report.
57. Phase wise project implementation schedule with bar chart and time frame, in terms of site development, infrastructure provision, EMS implementation etc.
58. Certificate of accreditation issued by the NABET, QCI to the environmental consultant should be incorporated in the EIA Report.
59. Explore the use of renewable energy to the maximum extent possible. Details of provisions to make the project energy-efficient through energy efficient devices and adoption of modes of alternative eco-friendly sources of energy like solar water heater, solar lighting etc. Measures proposed for energy conservation.
60. A tabular chart with index for point-wise compliance of above TORs.

IX. The TOR prescribed as above and as per the standard TOR approved by SEIAA and the model ToRs available in the MoEFCC's sector specific EIA Manual for **'Petro Chemical Based Processing Industries'** industries shall be considered as generic TORs for preparation of the EIA report in addition to all the relevant information as per the generic structure of EIA given in Appendix III in the EIA Notification, 2006.

X. The project proponent shall have to apply for Environmental clearance through online portal http://environmentclearance.nic.in/ along with final EIA report.

Validity of ToR:

- The ToRs prescribed for the project will be valid for a period of three years for submission of EIA & EMP report accordingly, ToR will lapse after 3 years from the date of issue.
- The period of validity could be extended for a maximum period of one year provided an application is made by the applicant to the Regulatory Authority, at least three months before the expiry of valid period together with an updated Form-I, based on proper justification and also recommendation of the SEAC.
- Unit shall comply all the conditions of O.M. published by MoEF&CC, New Delhi vide no. J-11013/41/2006-1A-11 (I) (Part) dated 29/08/2017 regarding ToR.

Executive Summary

1. Project name and location (Village, District, State, Industrial Estate (if applicable).

Continental Carbon Eco Technology Pvt. Ltd (CCET) is proposing to manufacture Carbon black (CB) with production capacity of 150000 TPA Carbon Black Plant with 16 MW Co-generation Power Plant by at Sy. No. D3/22, D2/15, GIDC notified industrial area, Dahej Village, Vagra Tehsil, Baruch Dist. of Gujarat.

2. Products and capacities. If expansion proposal then existing products with capacities and reference to earlier EC.

The main aim of the proposed project is manufacturing of Carbon Black by using thermal cracking of highly aromatic oils & generation of energy/power as by product from cogeneration plant (WHRPP). Total Utility system conceptual block diagram of the proposed project is given in **Figure 1** and details of project production capacities are given in **Table 1.**

Figure 1 Total Utility system conceptual block diagram

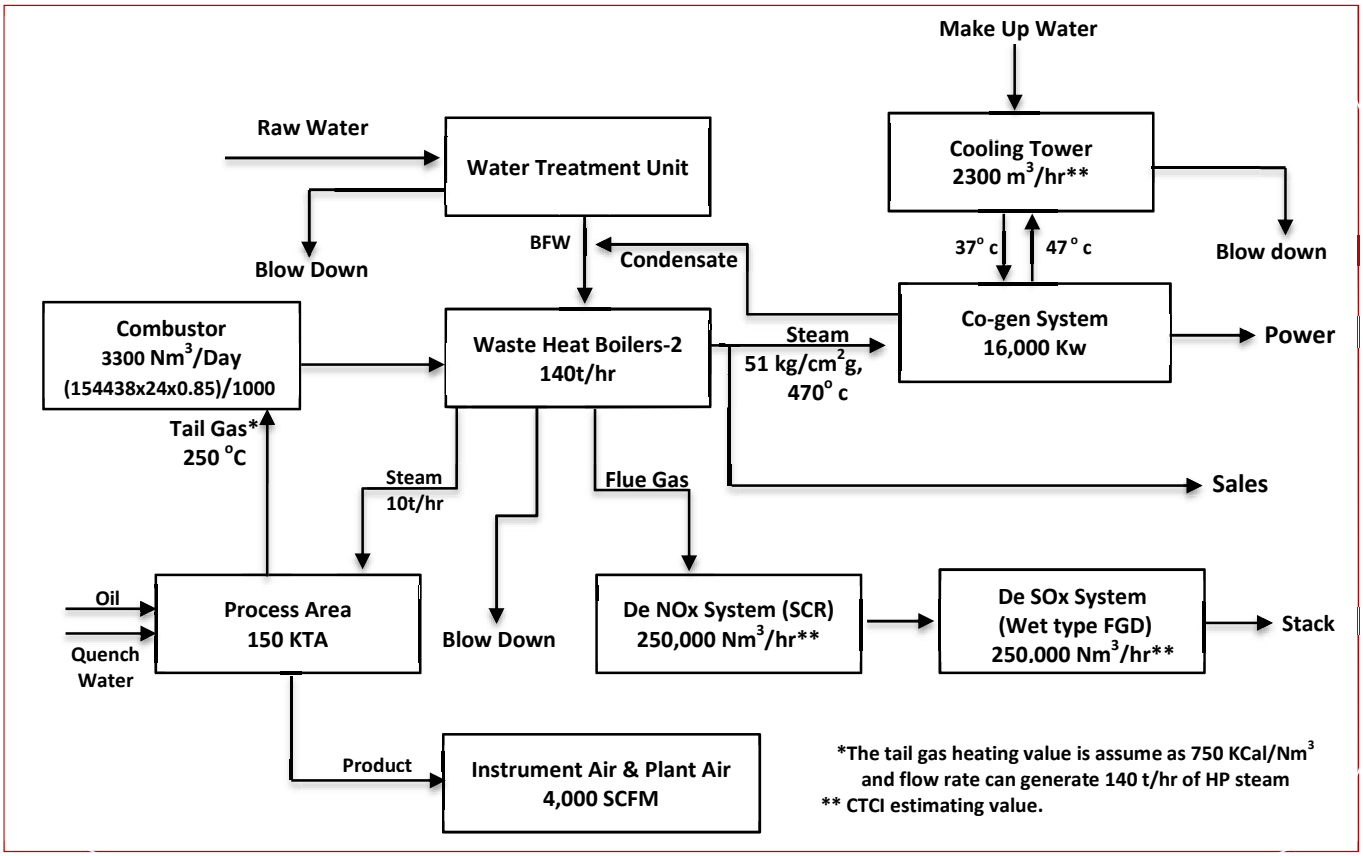


Table 1 Details of project capacities

S.No	Products	Quantity	End use of the product
1	Carbon Black	12500 TPM	Used for manufacturing of tyres, rubbers, plastic goods, etc.
2	Cogeneration power plant	16 MW (WHRPP)	A cogeneration system is installed to meet the requirement of power and steam for entire project

Cogeneration plant details				
S.No	**HP Stream**	**To ISBL**	**LP condensate**	**Total Power**
1	140 Ton/hr	10 Ton/hr	130 Ton/hr	16MW

3. Requirement of land, raw material, water, power, fuel, with source of supply

- **Land:**

The total lease area is 300000 Sq. m i.e. 74.13 Acres (30 ha), detailed land breakup is given in **Table 2.**

Table 2 Land area breakup

S.No	Description	Area (m^2)	Area in %
1	Production plant	26313	8.8
2	Product warehouse area	14818	4.9
3	Cogeneration power plant	14674	4.9
4	IA/PA and waste water area	10682	3.6
5	Demineralized and raw water area	12775	4.3
6	Flare KO drum and dumping area	8177	2.7
7	CBFS raw material storage area	23242	7.7
8	MCC and electrical substation area	17323	5.8
9	CBFS raw material unloading area	9052	3.0
10	Administration area	11355	3.8
11	Maintenance office/workshop/store building area	9000	3.0
12	Green area	120144	40.0
13	Miscellaneous area	22445	7.5
	Total plant area	**300000**	**100.0**

- **Water:**

Water required is met from water supply of Gujarat Water Infrastructure Limited (GWIL)/GIDC. Raw water supplied by GIDC up to plant battery limit will be stored in the raw water tank, which could be used to generate industrial water, process water, potable water, demineralized water, boiler feed water, etc. The raw water provided will be treated in water treatment plant and will be used for various plant requirements by the raw water feed pumps. Detailed total water requirement given in **Table 3.**

Table 3 Total water requirement (All values are in KLD)

Description	Fresh water	Treated water	Total water consumption	WW Generation
Process	1416	79	1495	0
DM Plant/Boiler	2569	0	2569	176
AQCS	480	0	480	301
Cooling Tower	63	1607	1670	1116
Road Washing	74	0	74	70
Domestic/Drinking/Canteen	26	0	26	25
Greenbelt	5	0	5	0
Total	**4633**	**1686**	**6319**	**1688**
Source: Gujarat Water Infrastructure Limited (GWIL)/GIDC				

- **Power requirement**

The power requirement for the project is met from the proposed, Cogeneration or Waste Heat recovery Power Plant (WHRPP); a heat engine to generate electricity and useful steam at the same time. A Cogeneration system will be installed to meet the requirement of power and steam for entire system. Detailed require quantity of utilities given in **Table 4.**

Table 4 Requirement of utilities

Utility	Unit	Quantity	Remark
Power Generation	kW	16,000	From WHRPP
Power Consumption	kW	16,000	For whole plant users
Steam	t/hr	140	For steam turbine at 51 kg/cm^{2}g, 470^{o}C
Raw Water	m^3/h	285	
Cooling Water	m^3/h	1670	
Plant Air	Nm^3/h	5,600	
Instrument Air	Nm^3/h	800	

4. Process description in brief, specifically indicating the gaseous emission, liquid effluent solid and hazardous wastes.

Carbon Black is produced by thermal cracking of refinery base or coal tar based CBFS. The production uses atomizing nozzles in a closed reactor to pyrolyze the feedstock oil under carefully controlled conditions. The feedstock is introduced into a high-temperature gas stream where the feedstock vaporizes and then combust them partially to form microscopic carbon particles. In most reactors, the reaction rate is controlled by steam or water sprays. The effluents from the reactors are essentially carbon-laden flue gases containing some combustibles. The heat energy from these gases is first used to preheat process air in an air pre-heater, and the reused to heat incoming CBFS in oil pre-heater.

The carbon laden flue gases enter the multi bag filter from the smoke header. The main bag filter is a filter house consisting of multi-cylinders, where carbon black is filtered. Carbon black is recovered from the bag filters by pulse / reverse jet flow of the flue gases into the cylinders Carbon black is collected from the filter bags and then dropped into to a pneumatic conveying line through air lock valves. Pneumatic convey fans draw carbon black through pulveriser and transferred to the accumulator tank through a conveying cyclone separator. The purpose of this cyclone is to separate carbon black form the conveying gas.

Carbon black collected in the accumulator tank is in a fluffy, powdery form, and is therefore pelletized. Pelletizsation is achieved in a wet pelletiser where the carbon black is mixed with water and binder solution. Indirectly fire rotary drum dryer is used to dry the wet pellets. Drying is achieved by burning the part of the waste gases from the main bag filter in waste gas combustor.

The dried Carbon Black is lifted by a bucket elevator and passed through a scalper screen, to separate lumps form the product and a magnetic separator, to separate accidental contamination of carbon black by magnetic particles.

Gaseous emissions: are emissions of gases or vapours from pressurized equipment due to leak or other unintended or irregular releases.

Fugitive emission may be contributed from the following sources:

- Leakage from pumps
- Equipment failure

- Spillages from pipelines
- Leakages from reactors
- Vapours venting from process/tanks
- Evaporation losses

Control Measures:

Control Measures adopted are:

- Process shall be closed system and vents are connected to the scrubbing system.
- Transfer of the material for proposed plant shall be through pipeline.
- Leak detectors shall be installed near by the source of leakage.
- Sweeping on roads.
- Proper monitoring system shall be established once the operation starts.
- Bitumen roads are laid inside the plant premises.

Liquid effluents: No liquid effluents are continuously discharged from the Carbon Black plant. Waste water coming from floor washings or equipment cleaning can be collected in settling ponds where the contained dust settles down. In Carbon Black plant, water is used mainly to feed the process equipment where it evaporates and is vented out as steam vapour to the atmosphere from the dryer Stack and Main Boiler stack. Occasional discharging of liquid streams is from the following areas: (which will be collected to the settling pond). Tail gas during plant starting or shutdown will be conveyed to flare, no design of wet scrubber for carbon black plant.

Solid and Hazardous waste:

The solid waste generated from the plant includes the following:

- General waste consisting of paper, plastics, polypropylene bags
- Pallets
- Residue from waste water treatment plant
- Sludge from biological treatment units of STP

The following measures are suggested to mitigate impact due to solid waste generation:

- General waste generated from the plant shall be send to municipal solid waste collection system
- Waste generated from process packaging shall be sold to authorized recyclers
- Hazardous waste containing carbon black shall be disposed to secured landfill
- Sludge from STP can be used as manure

The solid / Hazardous Waste will be collected and temporarily stored in Hazardous Waste Storage Area as per hazardous waste rules within the plant premises. The details of the solid and hazardous waste generation, quantification, classification, collection, transportation and disposal facility as per Hazardous Waste Rules 2016 and its amendment

5. Capital cost of the project, estimated time of completion.

The capital cost for the proposed project is estimated to be around Rs 802.87 Crores. After examining the environmental, commercial and financial feasibility of the proposed project, it is

inferred that the project may have positive viability. The detailed cost breakup of the proposed project is given in **Table 5.**

The overall building, plant & machinery cost amounts to Rs. 608 Crores and breakdown as below.

Table 5 Detailed Cost Breakup of the Project

EPC Cost	INR in Crores
ISBL	136
Co-Gen	189
Utility	173
Building	109
Total	**608**

6. Site selected for the project - Nature of land - Agricultural (single/double crop), barren, Govt./ private land, status of is acquisition

The manufacturing Carbon Black Plant with 16MW cogeneration power plant by CCET is proposed, at GIDC, industrial estate, Dahej (V), Vagra Tehsil, Baruch Dist. Sy. No. D3/22, D2/15. The existing land under is Industrial land as per GIDC development regulations. The existing land is open scrub.

Sandy soil, saline and alkali soils are found to occur in most parts of Bharuch district. The geology of this district is mainly composed of alluvium, brown sand, etc. Some tracts of Infra-trappean and undifferentiated Eocene beds are also observed.

7. Baseline environmental data - air quality, surface and ground water quality, soil characteristic, flora and fauna, socio-economic condition of the nearby population

Baseline monitoring studies were carried out during the summer season period (March to May) of 2019. Following are the observations made for quality of Air, Water, Soil, Noise, Biological, Social studies and traffic study etc.

Air environment

- The predominant wind direction during study period was SW to NW. Ambient Air Quality Monitoring stations were installed at 10 different locations. The maximum and minimum (98^{th} Percentile) values recorded for all the pollutants - PM_{10}, $PM_{2.5}$, SO_2, NO_x, O_3, CO, NH_3, VOC were found to be within the permissible limits.

Surface water & Ground water

- A total of 6 ground water samples and 3 surface water samples were collected from the study area in order to assess the water quality.

- pH of the ground water samples varied between 7.3 and 8.5. Total dissolved solids varied from 482 mg/l to 6924 mg/l. Chloride levels ranged from 84 mg/l to a maximum of 2714 mg/l. Hardness values varied from 152 mg/l to 2250 mg/l. Fluoride values were in the range of 0.13 mg/l to 1.20 mg/l.

- pH of the surface water was in the range of 7.7 to 8.2. The total dissolved solids were in the range of 932 to 33128 mg/l. Chlorides were in the range of 398 to 18080 mg/l. Hardness as

$CaCO_3$ varied between 160 to 9490 mg/l. Fluorides in the samples were found to be in the range of 0.51 mg/l to 1.04 . BOD values ranged from 12 to 18 mg/l.

- In conclusion the parameters in six groundwater samples were below acceptable limits and three ground water sample are found to be above permissible limit of IS -10500:2012 drinking water standards. Out of three surface water samples, one sample i.e. Narmada river is found to be above permissible limit of IS -10500:2012 drinking water standards.

Noise:

- Baseline noise levels have been monitored at ten locations within the study zone, using a continuous noise measurement device. The day equivalents during the study period ranged between 50.8 to 54.7 dB (A) whereas the night equivalents were in the range of 40.9 to 44.1 dB (A). It was observed that the day equivalents and the night equivalents were within the AAQ standards in respect of Noise SO 123 (E) dated. 14th Feb 2000, for Residential and Commercial area.

Traffic

- The traffic survey was carried out near the project site at SH-6 located 2.3Km south from the project site and SH-6 to project site connecting road. From the traffic survey, it was observed that the highest peak on SH-6 was 2433 PCU/hr during 10 am to 11 am; and on SH-6 to site connecting road is 247 PCU/hr during 9 am to 10 am. As per IRC the existing level of service is excellent. This implies that traffic will not have a major impact due to the proposed project.

Soil Quality

- Baseline soil samples have been monitored at ten locations within the study zone. It has been observed that the pH of the soil ranged from 7.4 to 8.4 indicating that the soils are normal to saline in nature. The electrical conductivity was observed to be in the range of 180 µS/cm to 633 µS/cm indicating that the soil is normal. The available nitrogen concentrations were found to be in the range of 85 kg/ha to 229 kg/ha indicating low nitrogen content. The available phosphorous concentrations were in the range of 5.2 kg/ha to 11.6 kg/ha. Six samples were found to have low phosphorus content, remaining four samples were having medium phosphorus content. The available potassium concentrations were found to be between 161 kg/ha and 325 kg/ha, which indicated that the five soils samples had high potassium content and remaining five samples medium potassium content

Flora & fauna

- There are no National Parks, Wildlife Sanctuaries, Biosphere Reserves and Important Bird Areas (IBA) within the study area. Except 1 reserved forest patch i.e. Dahej RF-10.1 km (west) is present within 15 km of study area. There are no reports of occurrence of any rare or endangered or endemic or threatened (REET) fauna as listed in the study area as per Indian Wildlife (Protection) Act 1972.

Socio-economic condition

- The project is located in the industrial area; GIDC as per 2011 census and the study area consists of 35823 people.

- The proposed project will additionally lead to direct and indirect employment opportunities. In addition, the company shall also earmark fund of Rs. 810 Lakhs towards CER and other developmental activities which will benefit the villagers in and around the project site.

- Around 400 manpower requirements were estimated to be required for proposed project. Preferences in employment will be given to local surrounding villagers.

8. Identification of hazards in handling, processing and storage of hazardous material and safety system provided to mitigate the risk.

Identification of hazards in the proposed project is one of the primary steps in the analysis, quantification and cost effective control of accidents, involving chemicals and process. A classical definition of hazard states that hazard is in fact the characteristic of system/plant/process that present potential for an accident. Hence, all the components of a system/plant/process will be thoroughly examined to assess their potential for initiating/propagating an unplanned event/sequence of events, which can be termed as an accident. The following two methods for hazard identification have been employed in the study:

- Identification of major hazardous units based on manufacture, storage and import of Hazardous Chemicals Rules, 1989 of Government of India (GoI Rules,1989); and
- Identification of hazardous units and segments of plants and storage units based on relative ranking technique, viz. Fire-Explosion and Toxicity Index (FE&TI).

An assessment of the conceptual design is conducted for the purpose of identifying and examining hazards related to feed stock materials, major process components, utility and support systems, environmental factors, proposed operations, facilities, and safeguards.

A preliminary hazard analysis is carried out initially to identify the major hazards associated with storages and the processes. This is followed by consequence analysis to quantify these hazards. Finally, the vulnerable zones are plotted for which risk reducing measures are deduced and implemented.

9. Likely impact of the project on air, water, land, flora-fauna and nearby population and Environmental management plan

- **Impact on Air Quality**

The major source of air pollution during operation period is mainly dust / particulate matter from process plant in production area and flue gas emission from boiler and DG set. To control the dust, particulate matter and stack emissions, as well as to meet the MoEF&CC standards, appropriate air pollution control equipments are proposed. The major source of SO_2 and NO_x emissions are DG sets and boilers used by the member industries. The predicted maximum ground level concentrations of 24 hour average of particulate matter, SO_2 and NO_x

concentrations are superimposed on the maximum baseline concentrations obtained during the study period to estimate the post project scenario, which would prevail at the post project operational phase.

The predicted incremental rise of combined industrial area for particulate matter is 0.68 $\mu g/m^3$, for SO_2 the value is 11.01 $\mu g/m^3$ and for NO_x the predicted value is 4.9 $\mu g/m^3$. The overall post project scenario along with existing baseline concentrations of particulate matter, SO_2 & NO_x are found to be 89.18 $\mu g/m^3$, 28.1 $\mu g/m^3$ and 32.0 $\mu g/m^3$ respectively, against the NAAQ standards of 100 $\mu g/m^3$ and 80 $\mu g/m^3$ for particulate matter, SO_2 & NO_x respectively. The mitigation measures are detailed in **Table 6.**

- **Impact on Water Quality**

  a) Water management

  The raw water received at the plant boundary will be sent to the wastewater treatment plant as water treatment system to produce demineralized water for the plant usage. The main users are the makeup water for boiler, cooling tower and De-SOx system and the minor portion water is to meet the greenbelt, fire water makeup, domestic requirements, etc.

  b) Wastewater generation

  In carbon black plant water is used mainly to feed the process equipment where it gets evaporated and is vented out as steam vapor to the atmosphere from purge gas filter, dryer stack and main boiler stack, there is no continuous discharge of effluent. However, occasional discharges will be from quench tower bottom. In addition there will be wastewater from floor washings and equipment cleaning from process activity. The process waste water will be treated in WWTP along with wastewater coming from DM plant regeneration, boiler blow down and cooling tower blow down. Entire treated water will be reused for industrial use and zero discharge concepts will be maintained.

  The domestic wastewater coming from domestic, drinking & canteen are collected separately and treated in STP, the treated water is reused and recycled. ZLD concept will be adopted.

- **Impact on Noise Environment**

  The main sources of noise and vibration during operation will be during Delivery of equipment and raw materials by trucks, operation of generators and turbine inside the cogeneration, operation of various pumps, fans and motors, loading and unloading of raw material at bulk storage area, transfer points. Equivalent sound level for day and night, L_{dn}, is often used to describe community noise exposure, which includes a night time penalty of 10 dB(A). The Ambient noise levels are found to be around 48.4 to 57.6 dB(A). The predicted sound levels from the project are found to be within the industrial zone standards.

However the exposure of workers to high noise levels especially, near the engine, vent shaft etc. need to be minimized. This can be achieved by rotation of jobs, carrying out automation, providing protective devices to employees, creating noise barriers around noise generating equipment, and soundproof compartments, control rooms etc.

- **Impact on Solid Waste**

The solid waste generated from the industrial activity will be classified based on its characteristics as follows. Manufacturing Process Waste—may fall under the hazardous waste and non- hazardous waste category. Waste from utilities includes liners, containers, barrels, paper, plastic and other packing waste. Pollution control facilities—WWTP sludge.

All hazardous waste will be stored temporarily at the designated storage areas and sent to final treatment and disposal as per the existing norms to common TSDF facility (BEIL). Whereas all recyclables such liners, containers, barrels, paper, plastic and other packing waste after decontamination will be handed over to registered agencies.

- **Impact of Traffic**

There is an addition of 183 PCUs (worst case) in a day during shift by the proposed project to the existing traffic (247 PCU/hr) on SH-6 to project site connecting front road. The total PCUs in future will be 430 PCUs in peak hour of the day and which is within the IRC-106-1990 Standards for 2 way/2 lane (roads with no frontage access, no standing vehicles very little cross traffic). Hence, there will be minimal impact on the existing road due to the proposed project. The level of service of the existing road is 'A' and it is expected to be converted to 'B' during operation of the project.

- **Impact on occupational health**

The damage risk criteria as enforced by Occupational Safety and Health Administration (OSHA) to reduce, health problems stipulates for 8-hour working per shift per day. Adequate air, water and noise pollution control measures will be provided in the proposed project to meet the regulatory standards. The environmental management and emergency preparedness plans are proposed to ensure that the probability of undesired events and consequences are greatly reduced and adequate mitigation are proposed in case of an emergency.

First aid facilities, agreements by nearby hospitals for meeting emergency requirement, etc. should be done by the time plant is going for operation. Training should be provided to certain number of employees in each division in providing first aid in case of accidents. The overall impact on human health would be negligible during operation of carbon black plant.

- **Impacts on Ecology**

Particulates and emissions are major air pollutants of a carbon based plant. The impact on the terrestrial ecosystem due to operation of a plant may occur from deposition and absorption of air pollutants on flora and soil surfaces. The proposed project will be carried out within the industrial estate. Hence, there will not be any cutting of natural vegetation

and chances of alteration of crop production and pattern of the area. There is no nation park or sanctuary located within the study area. No rare and endangered flora & fauna are reported within the study area.

Development of green belt and plantation within the project site would help in control the impact and improving the environmental quality of the surrounding area. A full-fledged development of green belt more than 33% of the project area with 3 tier plantation would further protect the ambient environment not only from various air emissions but also from noise.

- **Impacts on demography & socio-economics**

  The requirement of unskilled manpower will be met from nearby villages during construction and operation phase. The project will also help in generation of indirect employment apart from direct employment. It helps to improve the living conditions of the employees and nearby inhabitants. Conclusively there is a positive impact of the project on socio economic condition of the study area. Around Rs. 810 lakhs has been proposed for CER and other developmental activities as part of Enterprise Social Responsibility.

- **EMP Budget**

  In order to comply with the environmental protection measures, the management has made 244 Crores budgetary provision for environmental protection and safety measures, with a recurring cost of 24.16 Crores.

- **Employment Generation**

  The man power is one of the main resources requirements to operate and maintain the plant in a better and efficient way. Man power requirement for the proposed carbon black unit and utility unit is estimated at around 361 workers, the administrative personals estimate around 39 persons. A total of 400 employees will be required, of which 361 shall work in shifts.

Table 6 Proposed mitigation measures to be implemented during operation phase

Activity	Responsibility for implementation	Mitigation measures proposed	Targets to achieve	Risks and consequence of failure, if any
Air environment				
Manufacturing process of carbon black plant	EHS Cell	Provision of bag filters, rotary dryer, purge gas filters, adequate stack/vent height	To reduce the emission levels of PM 150mg/Nm^3; SO_2 850mg/Nm^3 and NOx 350mg/Nm^3 as per std.	Increase in particulate emissions and gaseous emissions Increase in ground level concentration of pollutants.
Cogeneration (WHRPP) plant (boiler)	EHS Cell	Provision of De-SOx and De-NOx systems	To reduce the emission levels of PM <150mg/Nm^3 (EPA notification for Carbon black plant) SO2 <850mg/Nm^3 and NOx <350 mg/Nm^3	
Operation of DG set	EHS Cell	Adequate stack height meeting MOEF standards	To reduce the emission levels of PM <0.3 g/KW-hr; and NOx+HC <7.5g/KW-hr as per std. MoEF&CC Notification 11th	Increase in fugitive emissions and damage to atmosphere

Activity	Responsibility for implementation	Mitigation measures proposed	Targets to achieve	Risks and consequence of failure, if any
			December, 2013.	
Transportation of raw materials and finished products	Transportation contractor/ Department	Ensuring PUC for all vehicles used and properly covered	To reduce CO and PM as per Central Motor Vehicle Rules 1989, Percentage of CO <0.5 and HC in ppm <750	
Water environment				
Industrial wastewater from process area, boiler, cooling tower, DM plant, etc.	EHS cell / WWTP operator	WWTP meeting Zero discharge concept (Conventional followed by RO, MEE, ATDF)	To meet reuse quality as per the requirement of the particular activity	Pollution of the GW & SW bodies
Sewage Treatment Plant	EHS cell / STP operator	Portable/ conventional type STP	To meet the MoEF&CC notification dated 13.10.17 (PH, BOD, TSS, FC)	Increase in concentration of pollutants especially biological parameters.
Noise Environment				
Boilers, DG sets, other noise generating equipment	EHS cell / concerned official operating the equipment	Provision of acoustic enclosures/barriers/ shield to reduce noise Provision of personal protective equipment like ear plugs and ear muffs.	To meet the Ambient air quality standards in respect to noise – Noise pollution rules 2000	Increase in in-plant and ambient noise levels
Solid Waste Management				
Hazardous and non-hazardous industrial waste	EHS cell	Segregation of waste as per the characteristics Temporary storage at site at designate location before disposal to TSDF	Disposal as per existing norms – HW rules, BMW rules, etc.	Contamination of the site and its surroundings
Municipal solid waste	EHS cell	Segregation of waste to recyclable, organic and inerts.	Environmentally safe disposal of municipal waste from canteen, and other activities	Contamination of the site and its surroundings
Others				
Afforestation & greenbelt development	EHS cell	Development of greenbelt along the boundary and 33% of the total land area	Ecological improvement Attenuation of air pollutants (PM's, SO_2, NOx) and noise in source receptor pathway	Reduction in aesthetics and living space. Higher pollutants in the ambient air.
Control of fire and explosion hazards	Fire & safety department	Necessary Fire & safety equipment	Zero fire accidents	Increased risk of fire and explosion

10. Emergency preparedness plan in case of natural or in plant emergencies

On-site and off-site emergency plans are prepared to respond in various emergency situations. In case of emergency necessary roles and responsibilities, assembly points, organizational setup etc. are formed. Safety equipments like extinguishers, hydrant system, alarm and siren of adequate number are kept at required locations. Regular mock drills will be carried as preparedness for any unseen emergencies.

11. CSR/CER plan with proposed expenditure

Activities Planned for proposed project:

The activities proposed under CER shall be worked based on the issues raised in public of nearby villages, social need assessment EMP etc., some of the activities which can be carried out in CER, are infrastructure creation for drinking water supply, sanitation, health, education, skill development, roads, cross drains, electrification including solar power, solid waste management facilities, scientific support and awareness to local farmers to increase yield of crop and fodder, rain water harvesting, soil moisture conservation works, avenue planation, plantation in community areas, etc. Detailed budgetary provision forr CER of proposed project is given below.

Table 7 Budgetary proposed for CER - Greenfield project

S.No	Item	Budget allocation in Rs in Lacks			
		1st year	2nd year	3rd year	Total
1	Drinking water supply	10	25	25	60
2	Health camps and facilities	20	35	35	90
3	Skill development	20	25	25	70
4	Roads & Cross drains	20	30	40	90
5	Electrification, Solar power	20	30	40	90
6	Sanitation, Solid waste management	20	30	40	90
7	Scientific support to farmers	20	25	25	70
8	Rainwater harvesting, soil conservation	20	25	25	70
9	Plantation (Avenue, community, schools, etc.)	20	30	40	90
10	Others as per the requirement	20	30	40	90
	Total	**190**	**285**	**335**	**810**

- Total Cost of the project is Rs. 802.87 Crores (Greenfield Project)
- CER fund 1.0% (Rs. 810 Lakhs) based on MoEF&CC office memorandum F.No.22-65/2017-IA.III dated 1st May 2018.
- The budget breakup is tentative, allotment will be based on the requirement by villagers, local government officials and district collector advise

12. Occupational health measures

Health of the employees would be regularly monitored as the workers are exposed to various operations. All the employees will be required to undergo a medical checkup before joining the facility. Medical checkup will be conducted on regular basis and the health conditions will be monitored. First aid facilities required to attend immediate emergency situations shall be made available at the facility; personal protective equipment are provided to employees / workers in operation phases.

13. Post project monitoring plan

Post project monitoring for environmental parameters will be implemented in compliance to EC/CTE/CTO of the project. The environmental parameters are being updated regularly and the facility for online monitoring of ambient air quality and the industry specific critical pollutants will be done at industry level. Specific requirement of monitoring will be carried out as directed.

14. Conclusion

Based on the EIA study it is observed that there will be a marginal increase in the air pollution, which will be mitigated by judicious implementation of the air pollution control measures like Bag

filter, dryer, purge gas filter and vent/stack for proper dispersion and plantation. There will be minimal impact on water and noise environment due to the operation activities moreover during operation, green belt development around the area will also be taken up as an effective pollution mitigation technique, as well as to control the pollutants released from the project premises. Monitoring program will be followed until operations continue. Hence, it can be summarized that the development of the project will have a positive impact on the socio-economic condition of the area around the project and would lead to development of as a whole.

However, the development of this project has many beneficial impact/effects in terms of bridging the demand and supply gap of carbon black products locally and globally and providing employment opportunities that will be created during the construction phase as well as during the operational phase of the project. Overall impacts will be beneficial to the region due to socio-economic up-liftment of the living standards of the people around the project area.

ENVIRONMENTAL IMPACT ASSESSMENT

for

Proposed Titanium Dioxide Slag Plant of 100000 TPA Capacity

at

Gudimetla (V), Chandarlapadu (M), Krishna District, Andhra Pradesh

Final Report

for

Environmental Clearance

Proponent

Satyavathi Minerals & Metals Limited

New MLA & MP colony, Jubilee Hills
Hyderabad- 500 033

Bhagavathi Ana Labs Limited

Prepared By

Bhagavathi Ana Labs Limited
(QCI/NABET Approved – Sl. No 13 as per List of Accredited Consultant Organizations Rev. 16/ January 05, 2014)

RAMKY GROUP
Towards sustainable growth

Ramky Enviro Engineers Limited
(QCI/NABET Approved – Sl. No 120 as per List of Accredited Consultant Organizations NABET/EIA/RA005rev.01/010

November - 2014

F. No. J-11011/272/2012-IA II (I)
Government of India
Ministry of Environment and Forests
(I.A. Division)

Paryavaran Bhawan
CGO Complex, Lodhi Road
New Delhi – 110 003

E-mail: yp.upadhyay@nic.in
Telefax: 011: 2436 2875
Dated: 20th February, 2013

To

Shri P.Dileep Kumar
President (Technical)
M/s Satyavathi Minerals and Metals Limited
Plot No. 75, New MLA & MP Colony
Road No. 10C, Jubilee Hills
Hyderabad – 500033.

Email: p_dileepkumar@rediffmail.com Fax: 040-23556913

Subject: **Proposed Titanium Dioxide slag Plant 1,00,000 TPA at Ramannapetta (Gudimetla) (V), Chandarlapadu (M) Krishna District, Andhra Pradesh by M/s Satyavathi Minerals and Metals Limited - regarding TORs**

Sir,

This has reference to your letter no. No. SMML/TOR/EC/12/01 dated 16th July, 2012 along with Form-I, Pre-feasibility report and proposed TORs as per the EIA Notification, 2006.

2. The above proposal was considered by the Reconstituted Expert Appraisal Committee (Industry) in its 4th meeting held during 8-9th January, 2013 for prescribing TORs for undertaking detailed EIA /EMP study.

3. The product mix and by-products details are as below:

Titanium Dioxide Slag - 100000 TPA	
Product mix	
Titanium dioxide slag (TiO_2 purity +85.4%)	32200 TPA
Synthetic Rutile (TiO_2 purity +95.5%)	30000 TPA
Pigment grade Titanium dioxide (TiO2 purity +99.5%)	30000 TPA
By-products	
Pig Iron	55000 TPA
$FeCl_2$	7000 TPA
Na_2SO_4 + Other Salts Predominately $FeSO_4$	39000 TPA
Un reacted Hydrochloric Acid and Sulphuric Acid is recycled back to the process	

3. Based on the information furnished and presentation made by you and your consultant M/s Ramky Enviro Engineers Limited, Hyderabad, the Committee prescribed the following TORs for preparation of EIA/EMP Report:

1. Executive summary of the project

2. Photographs of the proposed plant area.
3. Copies of coal linkage documents
4. A line diagram/flow sheet for the process and EMP
5. The earlier questionnaire for industry sector should be submitted while submitting EIA/EMP.
6. A site location map on Indian map of 1:10, 00,000 scale followed by 1:50,000/1:25,000 scale on an A3/A2 sheet with at least next 10 Kms of terrains i.e. circle of 10 kms and further 10 kms on A3/A2 sheets with proper longitude/latitude/heights with min. 100/200 m. contours should be included. 3-D view i.e. DEM (Digital Elevation Model) for the area in 10 km radius from the proposal site.
7. Present land use should be prepared based on satellite imagery. High-resolution satellite image data having 1m-5m spatial resolution like quickbird, Ikonos, IRS P-6 pan sharpened etc. for the 10Km radius area from proposed site. The same should be used for land used/land-cover mapping of the area.
8. Break up of small, medium and large farmers from whom the land is being acquired. If small farmers are involved, a detailed R&R plan.
9. Location of national parks / wildlife sanctuary / reserve forests within 10 km. radius should specifically be mentioned. A map showing land use / land cover, reserved forests, wildlife sanctuaries, national parks, tiger reserve etc. in 10 km of the project site.
10. Project site layout plan to scale using AutoCAD showing raw materials, fly ash and other storage plans, bore well or water storage, aquifers (within 1 km.) dumping, waste disposal, green areas, water bodies, rivers/drainage passing through the project site should be included.
11. Details and classification of total land (identified and acquired) should be included.
12. Proposal should be submitted to the Ministry for environment clearance only after acquiring total land. Necessary documents indicating acquisition of land should be included.
13. Rehabilitation & Resettlement (R & R) should be as per policy of the State Govt. and a detailed action plan should be included.
14. Permission and approval for the use of forest land and recommendations of the State Forest Department regarding impact of proposed expansion on the surrounding reserve forests, if applicable, should be included.
15. A list of industries containing name and type in 10 km radius shall be incorporated.
16. List of raw material required and source along with mode of transportation should be included. All the trucks for raw material and finished product transportation must be "Environmentally Compliant".
17. Studies for titanium slag material and solid waste generated should also be included, if the raw materials used has trace elements and a management plan.
18. Manufacturing process details all the plants should be included.
19. Mass balance for the raw material and products should be included.
20. Energy balance data for all the components should be incorporated.
21. Site-specific micro-meteorological data using temperature, relative humidity, hourly wind speed and direction and rainfall should be collected.
22. Sources of secondary emissions, its control and monitoring as per the CPCB guidelines should be included. A full chapter on fugitive emissions and control technologies should be provided.
23. An action plan to control and monitor secondary fugitive emissions from all the sources as per the latest permissible limits issued by the Ministry vide G.S.R. 414(E) dated 30th May, 2008.
24. Vehicular pollution control and its management plan should be submitted.
25. A write up on use of high calorific hazardous wastes from all the sources and commitment regarding use of hazardous waste should be included.
26. Ambient air quality at 8 locations within the study area of 10 km., aerial coverage from project site with one AAQMS in downwind direction should be carried out.

27. The suspended particulate matter present in the ambient air must be analyzed for the presence of poly-aromatic hydrocarbons (PAH), i.e. Benzene soluble fraction. Chemical characterization of RSPM and incorporating of RSPM data.
28. Determination of atmospheric inversion level at the project site and assessment of ground level concentration of pollutants from the stack emission based on site-specific meteorological features.
29. Air quality modeling for all the proposed plants for specific pollutants needs to be done. APCS for the control of emissions within 50 mg/Nm^3 should be included. Impact on the near by forests shall be assessed.
30. Action plan to follow National Ambient Air Quality Emission Standards issued by the Ministry vide G.S.R. No. 826(E) dated 16th November, 2009 should be included.
31. Ambient air quality monitoring should be included for the day (24 hrs) for maximum GLC along with following :
    i) Emissions (g/second) with and without the air pollution control measures
    ii) Meteorological inputs (wind speed, m/s), wind direction, ambient air temperature, cloud cover, relative humidity
    iii) Model input options for terrain, plume rise, deposition etc.
    iv) Print-out of model input and output on hourly and daily average basis
    v) A graph of daily averaged concentration (MGLC scenario) with downwind distance at every 500 m interval covering the exact location of GLC.
    vi) Details of air pollution control methods used with percentage efficiency that are used for emission rate estimation with respect to each pollutant
    vii) Applicable air quality standards as per LULC covered in the study area and % contribution of the proposed plant to the applicable Air quality standard. In case of expansion project, the contribution should be inclusive of both existing and expanded capacity.
    viii) No. I-VII are to be repeated for fugitive emissions and any other source type relevant and used for industry
    ix) Graphs of monthly average daily concentration with down-wind distance
    x) Specify when and where the ambient air quality standards are exceeded either due to the proposed plant alone or when the plant contribution is added to the background air quality.
    xi) Fugitive dust protection or dust reduction technology for workers within 30 m of the plant active areas.
32. Impact of the transport of the raw materials and end products on the surrounding environment should be assessed and provided.
33. One season data for gaseous emissions other than monsoon season is necessary.
34. Presence of aquifer(s) within 1 km of the project boundaries and management plan for recharging the aquifer should be included.
35. Source of surface/ground water level, site (GPS), cation, anion (Ion Chromatograph), metal trace element (as above) chemical analysis for water to be used along with a Piper and Piper Duro-V diagram. If surface water is used from river, rainfall, discharge rate, quantity, drainage and distance from project site should also be included.
36. Ground water analysis with bore well data, litho-logs, drawdown and recovery tests to quantify the area and volume of aquifer and its management.
37. Ground water modelling showing the pathways of the pollutants should be included
38. Column leachate study for all types of stockpiles or waste disposal sites, at 20 °C-50 °C should be conducted and included.
39. Action plan for rainwater harvesting measures at plant site should be submitted to harvest rainwater from the roof tops and storm water drains to recharge the ground water and also to use for the various activities at the project site to conserve fresh water and reduce the water requirement from other sources. Rain water harvesting and groundwater recharge structures may also be constructed outside the plant premises in consultation with local Gram Panchayat and Village Heads to augment the ground water level. Incorporation of water harvesting plan for the project is necessary, if source of water is bore well.

40. Permission for the drawl of water from the concerned authority and water balance data including quantity of effluent generated, recycled and reused and discharged is to be provided. Methods adopted/to be adopted for the water conservation should be included.
41. A note on the impact of drawl of water on the nearby River during lean season.
42. Surface water quality of nearby River (60 m upstream and downstream) and other surface drains at eight locations must be ascertained.
43. If the site is within 10 km radius of any major river, Flood Hazard Zonation Mapping is required at 1:5000 to 1;10,000 scale indicating the peak and lean river discharge as well as flood occurrence frequency.
44. A note on treatment of wastewater from different plants, recycle and reuse for different purposes should be included.
45. Provision of traps and treatment plants are to be made, if water is getting mixed with oil, grease and cleaning agents.
46. If the water is mixed with solid particulates, proposal for sediment pond before further transport should be included. The sediment pond capacity should be 100 times the transport capacity.
47. The pathways for pollution via seepages, evaporation, residual remains are to be studied for surface water (drainage, rivers, ponds, lakes), sub-surface and ground water with a monitoring and management plans.
48. Ground water monitoring minimum at 8 locations and near solid waste dump zone, Geological features and Geo-hydrological status of the study area are essential as also. Ecological status (Terrestrial and Aquatic) is vital.
49. Action plan for solid/hazardous waste generation, storage, utilization and disposal. A note on the treatment, storage and disposal of all type of solid waste should be included. End use of solid waste viz. fly ash etc. and its composition should be covered.
50. All stock piles will have to be on top of a stable liner to avoid leaching of materials to ground water.
51. Action plan for the green belt development plan in 33 % area should be included. The green belt should be around the project boundary and a scheme for greening of the travelling roads should also be incorporated. All rooftops/terraces should have some green cover.
52. A scheme for rainwater harvesting has to be put in place. Incorporation of water harvesting plan for the project is necessary, if source of water is bore well. Efforts should be made to make use of rain water harvested. If needed, capacity of the reservoir should be enhanced to meet the maximum water requirement. Only balance water requirement should be met from other sources.
53. Detailed description of the flora and fauna (terrestrial and aquatic) should be given with special reference to rare, endemic and endangered species.
54. Action plan for the green belt development plan in 33 % area should be included. The green belt should be around the project boundary and a scheme for greening of the travelling roads should also be incorporated. All rooftops/terraces should have some green cover.
55. Detailed description of the flora and fauna (terrestrial and aquatic) should be given with special reference to rare, endemic and endangered species.
56. Disaster Management Plan including risk assessment & damage control needs to be addressed and included. Landslide hazard map and mitigation plan, Earthquake history and management plan should be submitted.
57. Details regarding expected Occupational & Safety Hazards. Protective measures for Occupational Safety & Health hazards so that such exposure can be kept within permissible exposure level so as to protect health of workers. Health of the workers with special reference to Occupational Health. Plan of exposure specific health status evaluation of workers; pre placement and periodical health status of workers; plan of evaluation of health of workers by pre designed format, chest x ray, Audiometry, Spirometry Vision testing (Far & Near vision, colour vision and any other ocular

defect) ECG, during pre placement and periodical examinations and plan of monthly and yearly report of the health status of workers with special reference to Occupational Health and Safety.

58. Corporate Environment Policy
    i. Does the company have a well laid down Environment Policy approved by its Board of Directors? If so, it may be detailed in the EIA report.
    ii. Does the Environment Policy prescribe for standard operating process / procedures to bring into focus any infringement / deviation / violation of the environmental or forest norms / conditions? If so, it may be detailed in the EIA.
    iii. What is the hierarchical system or Administrative order of the company to deal with the environmental issues and for ensuring compliance with the environmental clearance conditions? Details of this system may be given.
    iv. Does the company have system of reporting of non compliances / violations of environmental norms to the Board of Directors of the company and / or shareholders or stakeholders at large? This reporting mechanism should be detailed in the EIA report.
59. At least 5 % of the total cost of the project should be earmarked towards the Enterprise Social Commitment based on Public Hearing issues and item-wise details along with time bound action plan should be prepared and incorporated.
60. Total capital cost and recurring cost/annum for environmental pollution control measures.
61. Public hearing issues raised and commitments made by the project proponent on the same should be included separately in EIA/EMP Report in the form of tabular chart with financial budget for complying with the commitments made.
62. Any litigation pending against the project and / or any direction / order passed by any Court of Law against the project, if so, details thereof.

The following general points should be noted:

i. All documents should be properly indexed, page numbered.
ii. Period/date of data collection should be clearly indicated.
iii. Authenticated English translation of all material in Regional languages should be provided.
iv. The letter/application for environmental clearance should quote the MOEF file No. and also attach a copy of the letter.
v. The copy of the letter received from the Ministry should be also attached as an annexure to the final EIA-EMP Report.
vi. The index of the final EIA-EMP report must indicate the specific chapter and page no. of the EIA-EMP Report
vii. While preparing the EIA report, the instructions for the proponents and instructions for the consultants issued by MoEF vide O.M. No. J-11013/41/2006-IA.II (I) dated 4th August, 2009, which are available on the website of this Ministry should also be followed.
viii. The consultants involved in the preparation of EIA/EMP report after accreditation with Quality Council of India (QCI) / National Accreditation Board of Education and Training (NABET) would need to include a certificate in this regard in the EIA/EMP reports prepared by them and data provided by other organization/Laboratories including their status of approvals etc.

It was decided that 'TORs' prescribed by the Reconstituted Expert Appraisal Committee (Industry) should be considered for preparation of EIA / EMP report for the above mentioned project in addition to all the relevant information as per the 'Generic Structure of EIA' given in Appendix III and IIIA in the EIA Notification, 2006. The draft EIA/EMP report shall be submitted to the Andhra Pradesh Pollution Control Board for public hearing. The

issues emerged and response to the issues shall be incorporated in the EIA report. The final EIA report shall be submitted to the Ministry for obtaining environmental clearance.

The TORs prescribed shall be valid for a period of two years for submission of the EIA/EMP report including public hearing proceedings.

(Dr.V.P.Upadhyay)
Director(S)

Copy to :-

1. The Additional Principal Chief Conservator of Forests, Ministry of Environment & Forests, Regional Office –Eastern Zone, Kendriya Sadan, 4th Floor, E&F Wing, II Block Koramangala, Banglore-560034.

2. The Chairman, Andhra Pradesh Pollution Control Board, Paryavaran Bhawan, A3, Industrial Estate, Sanath Nagar, Hyderabad – 500018.

(Dr.V.P.Upadhyay)
Director(S)

CHAPTER-1
INTRODUCTION

1.1 PURPOSE OF THE REPORT

M/s. Satyavathi Minerals and Metals Limited (SMML) is proposing to set up a Titanium dioxide manufacturing plant at Gudimetla village, Chandarlapadu Mandal, Nandigama Taluk, Krishna District, Andhra Pradesh, using an eco-friendly technology.

Titanium is the 9th most abundant element, constituting about 0.6% of the Earth's crust. The various types of titanium products that find wide spread application are mineral concentrates, Titanium sponge/metal, Titanium slag, Titanium dioxide pigment. Titanium metal finds applications in aerospace, defence and other vital areas. Its alloys are used for cryogenic and marine applications as well. Out of the total titanium dioxide pigment that is manufactured annually, 59% is used by paints industry, 24% by plastics industry, 12% by paper industry and the remaining 5% by finds use in other sectors of the industry, such as catalysts, ceramics, coated fabrics, textiles, floor coverings, printing inks and roofing granules respectively. The principal mineral sources of titanium are Rutile, Anatase, Ilmenite ($FeOTiO_2$) and Leucocxene.

M/s. Outotec, Germany, experts in the reduction and smelting technology are providing the necessary equipment along with technology. Institute of Process Engineering, Chinese Academy of Sciences, Beijing is offering molten bath technology which is environmental friendly, to manufacture Titanium Dioxide (Pigment Grade).

As per EIA notification S. O. 1533, issued on 14th September, 2006 and its subsequent amendments the proposed project is falling under Project / Activity 3(A) – Metallurgical Industries (Ferrous & Non Ferrous) and Category A – All toxic and heavy metal producing units ≥ 20,000 TPA, and require Environmental Clearance from Expert Appraisal Committee (EAC), Ministry of Environment and Forests (MoEF), New Delhi. SMML has submitted Form 1 application for obtaining Terms of Reference (TOR) from EAC.

The proposal was considered by the Expert Appraisal Committee (EAC) held during 1st January 2013 for determination of the Terms of Reference for undertaking detailed EIA Study in accordance with the provisions of the EIA notification dated 14th September, 2006. The EAC has given Terms of Reference vide its letter dated 20th February, 2013 F.No. J-1101/272/2012-IA II (I).

The public hearing for the proposed project was conducted by the Andhra Pradesh State Pollution Control Board (APPCB) on 06.08.2012 in the presence of The District Revenue Officer and Additional District Magistrate, at the premises of the proposed project site, as per the EIA notification. The press notification indicating the date and venue of the public hearing was issued by Environmental Engineer, Regional Office, Vijayawada, Andhra Pradesh and the same was published in daily newspapers namely Eenadu (Telugu) and The Hindu

(English) on 5th July, 2014 inviting suggestions, views and objections on matters relating to environmental aspects of the proposed project.

The EIA report prepared based on the approved ToR along with Executive Summary in Telugu and English was made available to the public for the purpose of Public Hearing. Based on the proceedings of the public hearing, the EIA report has been upgraded and being submitted for Environmental Clearance to the Ministry of Environment and Forests, New Delhi.

The final EIA report is submitted to MoEF for seeking appraisal of MoEF for grant of prior Environmental Clearance (EC) from MoEF and Consent for Establishment from Andhra Pradesh Pollution Control Board (APPCB).

1.2 PROJECT

The proposed project is to manufacture Titanium dioxide of different grades as per the market demand. The details of the products proposed to be manufactured along with by-products formed and its capacities are given in **Table 1.1.**

Table 1.1
Details of the proposed products

S.No	Products	Quantity TPA	Remarks
1	Titanium dioxide slag (TiO_2 purity +85.4%)	32200	Overall plant capacity is 100000 TPA Titanium dioxide
2	Synthetic Rutile (TiO_2 purity +95.5%)	30000	
3	Pigment grade Titanium dioxide (TiO_2 purity +99.5%)	30000	
	By products - Sold in the market		
1	Pig Iron	55000	
2	Ferrous Chloride ($FeCl_2$)	7000	
3	Sodium Sulfate (Na_2SO_4) Containing other salts predominantly $FeSO_4$	39000	
Unreacted Hydrochloric Acid and Sulphuric Acid is recycled back in process			
Details of Power Plant			
1	CPP	20MW	Captive Power plant

1.2.1 Project Proponents

The company would be guided by following directors, whose profiles are given below.

(i) Mr. Y. Naveen Srinivasa

Mr. Y. Naveen Srinivasa has done his under graduation and post graduation in Mechanical Engineering in Coventry University, in Coventry (U.K.) and also a Post Graduate in Management from Leicester University, Leicester (U.K.).

He was associated in development of infrastructural facilities for housing information technology industry (IT) at different places as separate SPV.

M/s. Cyber Park Development Corporation Limited, a Joint Venture Project with L&T, to develop infrastructure for software companies over the land provided by STPI, Bangalore.

The Company has completed 5 Lac Sft. IT Park space and the same is fully operational. Developed infrastructure facility of 25000 sft for software development project at Sadashiva Nagar, Bangalore.

Developed infrastructure facility of 1 Lac Sft. at Pondy Bazaar, Chennai. M/s. CSS Corporation Pvt. Ltd., software developer is operating from this facility.

Developed facilities for IT industry of 98000 Sft. at "PRINCE INFOCITY" at old Mahabalipuram Road, Chennai. M/ s. 3-I InfoTech Limited, a subsidiary of ICICI Bank is operating from this facility.

Mr. Y. Naveen Srinivasa has been working on various technologies available globally to manufacture Titanium Dioxide Slag and Titanium Dioxide (Pigment Grade) along with Dr.D.P.Rao. In the process he contacted M/s. Bateman Engineering Pvt. Ltd., (Australia and South Africa), Institute of Process Engineering, Chinese Academy of Sciences, Beijing, National Institute of Interdisciplinary Science and Technology (NISST), Thiruvananthapuram and Outotec before arriving at the right choice of technology. On choosing best technology option, Mr. Naveen Srinivasa signed an MOU with Institute of Process Engineering for Technology transfer to manufacture Titanium Dioxide (Pigment Grade) from Titanium Dioxide Slag as feed stock, M/s. Outotec India Pvt. Ltd., well known for reduction and smelting technologies has been chosen for technology and equipment supply.

For the purpose of implementing this project, he floated Satyavathi Minerals and Metals Limited.

(ii) Dr. Davuluri Prahlada Rao

An M.Tech and a Ph. D in Chemical Engineering from IIT, Khargpur and BITS Pilani respectively, Dr. Davuluri Prahlada Rao has extensive academic experience, spanning almost across four decades. Beginning as a Lecturer in BITS in 1967 he retired as a Professor in the Department of Chemical Engineering at IIT Kanpur in 2005; holding different positions over this tenure. Post his retirement from IIT Kanpur, he setup his own venture known "Process Intensification Consultant".

(iii) Mr. B. Ramachander Rao

Mr. B. Ramachander Rao is a LLB graduate from Osmania University. He has completed his Charted Accountancy, Cost Accountancy and Company Secretary courses. Starting as an

Assistant Manager with M/s. A.F.Ferguson & Company, he has spent about 28 years in the financial sector, presently he is a Director (Corporate Affairs) in SJK Steel Plant Ltd. He is responsible for corporate planning, finance, legal and secretarial matters of the organization.

1.3 OBJECTIVE & SCOPE OF THE STUDY

The objective of an EIA study is to identify, predict, evaluate, and mitigate the biophysical, social, and other relevant effects of proposed project, prior to establishment of the project. These studies integrate the environmental concerns and mitigation measures into the project planning stages like design, construction and operation of the project. To achieve the above objectives the following strategy is recommended.

1 EIA to be prepared with base line data collection and making use of preliminary design specifications/data of the proposed operations.
2 The findings and recommendations of the study are to be incorporated into the project planning, design, conducting operations of the project.
3 The EIA will cover one season baseline environmental data, as per the guidelines of MoEF, New Delhi.

In all industrial projects, the plant activities must co-exist satisfactorily with its surrounding environment so as to reduce the environmental impact caused due to project activities. To control the adverse impacts, sound and safe environmental management plan has to be implemented by the proponents, which makes environmental protection as essential requirement along with profits due to the production.

In order to assess the likely impacts arising out of the proposed project on the surrounding environment and evaluating means of alleviating the likely negative impacts, if any, from the proposed project, the project management has retained Ramky Enviro Engineers Limited (REEL), as their environmental consultant in order to assess the likely impacts arising out of the proposed project. REEL had carried out the Environmental Impact Assessment (EIA) studies for various environmental components which are likely to be affected.

1.3.1 Scope of EIA

The scope of study includes detailed characterization of existing status of environment in an area of 10 km with the proposed project as its centre for various environmental components.

The envisaged scope of EIA is as follows:

- To assess the present status of air, noise, water, land, biological and socio-economic components of environment.
- Identification and quantification of significant impacts of proposed operations on various components of environment.

- Evaluation of proposed pollution control facilities.
- Preparation of sound Environmental Management Plan (EMP) outlining control technologies to be adopted for mitigation of adverse impacts (if any)
- Delineation of the post-project environmental quality monitoring program to be followed.

Any developmental activity in general is expected to cause impacts on surrounding environment at the project site during its implementation and operation phases, which can be both positive and negative. The nature and intensity of impacts on different components of environment depend on the type of project activities and geographical conditions of the study area. The impacts of the project activities on environmental components can be quantified through EIA studies within the impact zone of the project activities. The results of EIA studies form the basis for the preparation of a viable EMP for mitigation of the adverse impacts.

1.3.2 Study Period

For the preparation of EIA report for the proposed project, the data was collected for summer season of 2013 (March 2013 to May 2013) of the study area. The micro climatic parameters were recorded using manual weather station for the study period. Wind speed, wind direction and relative humidity were recorded on hourly basis. Minimum & Maximum temperatures were also recorded during the study period.

1.3.3 Air Environment

An area covering 10 km radial distance surrounding the proposed project site was identified as study area (Impact Zone). The topographical information of the project site, study area, and the details of different activities related to the proposed project were collected. Air pollutants as per the National Ambient Air Quality Standards (NAAQ) standards were identified as related to the project activities for representing baseline status of ambient air quality within the study area.

Pre-calibrated Dust Samplers were used for monitoring all the air pollutants. Modeling of air quality predictions was carried out using AERMOD software, a licensed version from Lakes Environment. It has been recognized internationally for its technologically advanced air dispersion modelling software and also for its exceptional expertise in the area of IT solutions for environmental sciences.

1.3.4 Noise Environment

Excessive noise levels cause adverse effects on human beings and the associated environment including domestic animals, wild life, natural eco-system, and structures. Hence noise survey is carried out at the proposed site and nearby villages. Noise levels (A-Weighted) were measured at using precision sound level. The principle of propagation of sound waves was used to estimate the noise levels at various locations.

1.3.5 Water Environment

Information on water resources in the study area was collected. The water resource in the study area mainly comprises of, groundwater, surface water sources etc. The parameters of prime importance for water quality studies were selected under physical and chemical groups etc. Samples were collected at different locations in the study area.

1.3.6 Land Environment

Soil samples were collected from the plant site, not only at its immediate vicinity but also in the surrounding villages in a 10 km radial zone. Physico-chemical properties of the soils were determined. Information on land use pattern in the study area was also collected. Information regarding existing cropping pattern, their types and yield of the crop was collected from various sources. Based on the attenuation factors for dust aerosols and air pollutants, green belt species have been identified.

1.3.7 Eco-System

Information on eco-system within 10 km radius was collected from the state Agricultural and Forest departments. The important flora species native to the area is enumerated. A test check survey was also under taken to judge the correctness of the data collected.

1.3.8 Socio-Economic Environment

A field survey was conducted within 10 km radius of the plant and the surrounding impact zone. The parameters selected under socio-economic component were demographic structure of the study area, provision of basic amenities, industries likely to come up in the study area, welfare facilities proposed by the project proponent, safety training and management, community and occupational health hazards. Relevant information was collected from selected villages and analyzed.

CHAPTER-2
PROJECT DESCRIPTION

2.1 Type of the project

The proposed project is to manufacture Titanium dioxide slag from illeminite, and to upgrade the slag to synthetic rutile and pigment grad titanium dioxide.

2.2 Need of the project

The titanium pigment industry is valued in excess of $ 11 billion per year, making it one of the world's most popular inorganic chemical industries. In the developed countries consumption of titanium pigment is 2.0 kg per capita today. It is less than 1 kg per capita in the developing countries, 0.4 kg in China, 0.15 kg in India-. Developing countries are likely to show a major growth in the consumption of pigment in the future. Developing countries have already started showing an increase in their annual pigment consumption by around 6% for the last 5 years. Total growth in 2010 was more than 18% compared to that in 2009. North America and Europe remained the top consumers of pigment with a moderate growth rate, while Asia and especially China showed significant growth in demand (almost 6%). The titanium sponge/metal industry is also very significant with total world production having a value of around $ 3 billion per year. Estimated capacity of titanium dioxide pigment in the world was 5.28 million TPA in 2008 out of which USA alone accounted for 1.58 million tons.

Major pigment capacity expansions were underway in Australia (50,000 TPA, 2010), Saudi Arabia (92,000 TPA, 2009), UK (50,000 TPA, 2009), India (40,000 TPA, 2013), US (350,000 TPA, 2014) and China (600,000 TPA, 2012).It is expected that this would increase the international demand for titanium feed stocks by approx. 2,000,000 TPA. World titanium dioxide feed stocks demand was about 6 million tons in 2010. Global titanium dioxide (titanium dioxide) markets have been tight in 2011 because of reduced capacity with several producers decreasing output during the recession and, as demand recovered, they struggled to cater for all of their customers' needs. This led to price rise of the product and the raw materials. The feedstock demand is expected to rise to 6.5 million tons by 2012 .The feedstock supply was about 5.05 million tons in 2007 and is expected to increase to 6 million tons by 2012. Thus there exists a gap in the feedstock supply and demand. Asia is considered to be the fastest growing titanium dioxide market with projections of 6-7 % future growth rates per year. Analysts forecast that China would represent 17% of global titanium dioxide consumption by 2010-2011. India is the next power house with growth rates of 8-10% per year while demand in South East Asia is growing at 4-6% per year.

The present requirement of titanium dioxide in the country is estimated at 150,000 metric tons. Out of this about 64% is used in the paints industry. India imported 79,124 metric tons of titanium dioxide pigment in 2009 while it imported 71,576 metric tons of titanium dioxide pigments the previous year. Imports had increased by 11%. At present there is no company in India which manufactures titanium dioxide slag. Manufacture of titanium dioxide slag would reduce the quantity of waste products by 300-400% and help the sulphate route plants to combat pollution. The capacity increase of the domestic players in the pigment industry and the increase in imports of pigments indicate an increased requirement of feedstock. This shows the need for titanium slag in the market.

2.3 LOCATION

The proposed project is coming up at Gudimetla Village, Chandarlapadu Mandal, Nandigama Taluk, Krishna District, Andhra Pradesh. The Latitude and Longitude of the proposed site is 16^{o} 43′ 06.4″N and 80^{o} 09′ 21.8″E. The nearest Railway station and Airport to the proposed site is Vijayawada which is 40 km away in SE direction.

The location map showing location of the project site is given in **Figure 2.3.1,** The 10 km radius Topographical map is given as **Figure 2.3.2**. The proposed plant layout is given as **Figure 2.3.3**. The photographs of the site are shown in **Figure 2.3.4.**

Figure 2.3.1
Site Location map of the project

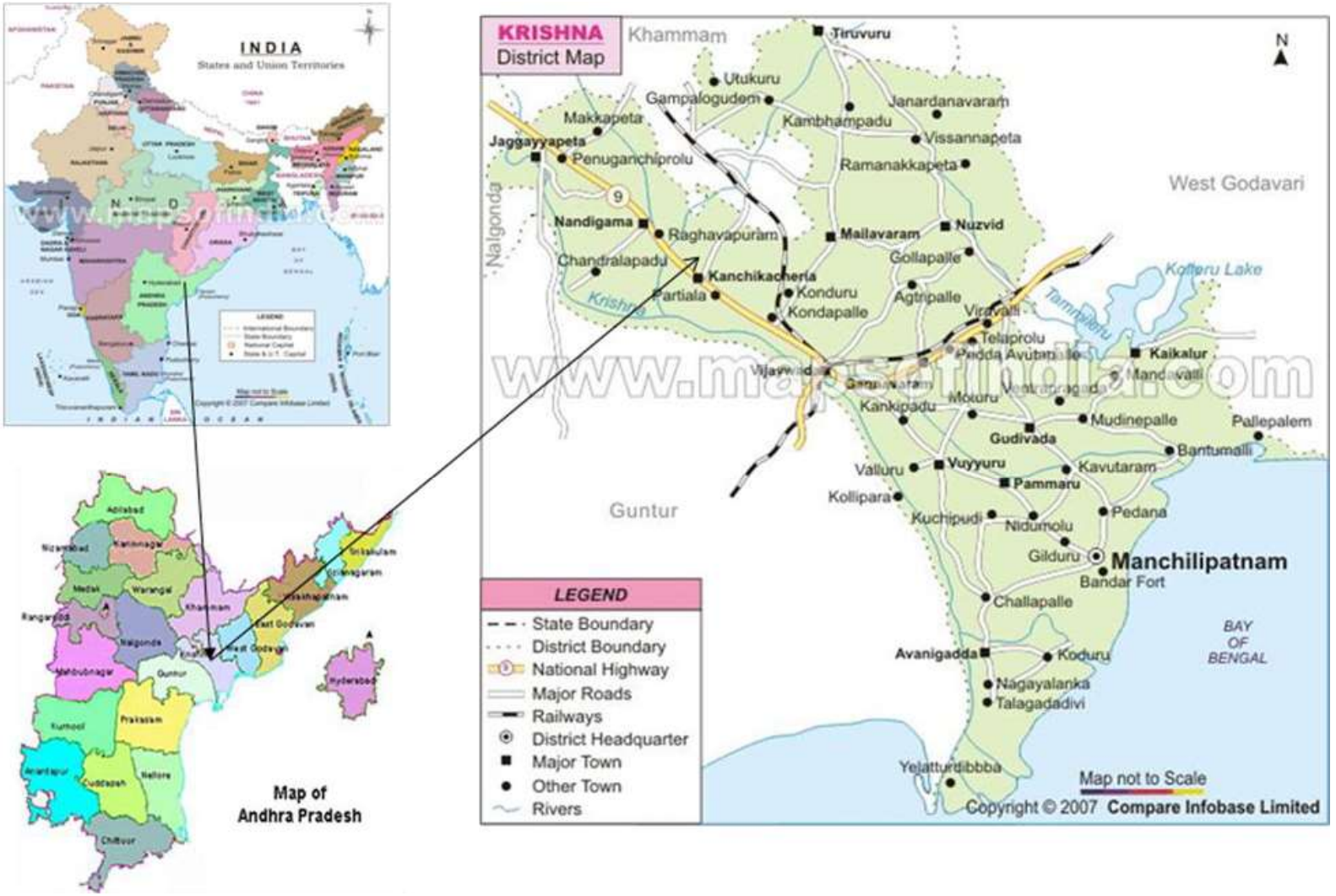


Figure 2.3.2
10 km Radius (from boundary) Topographical Map

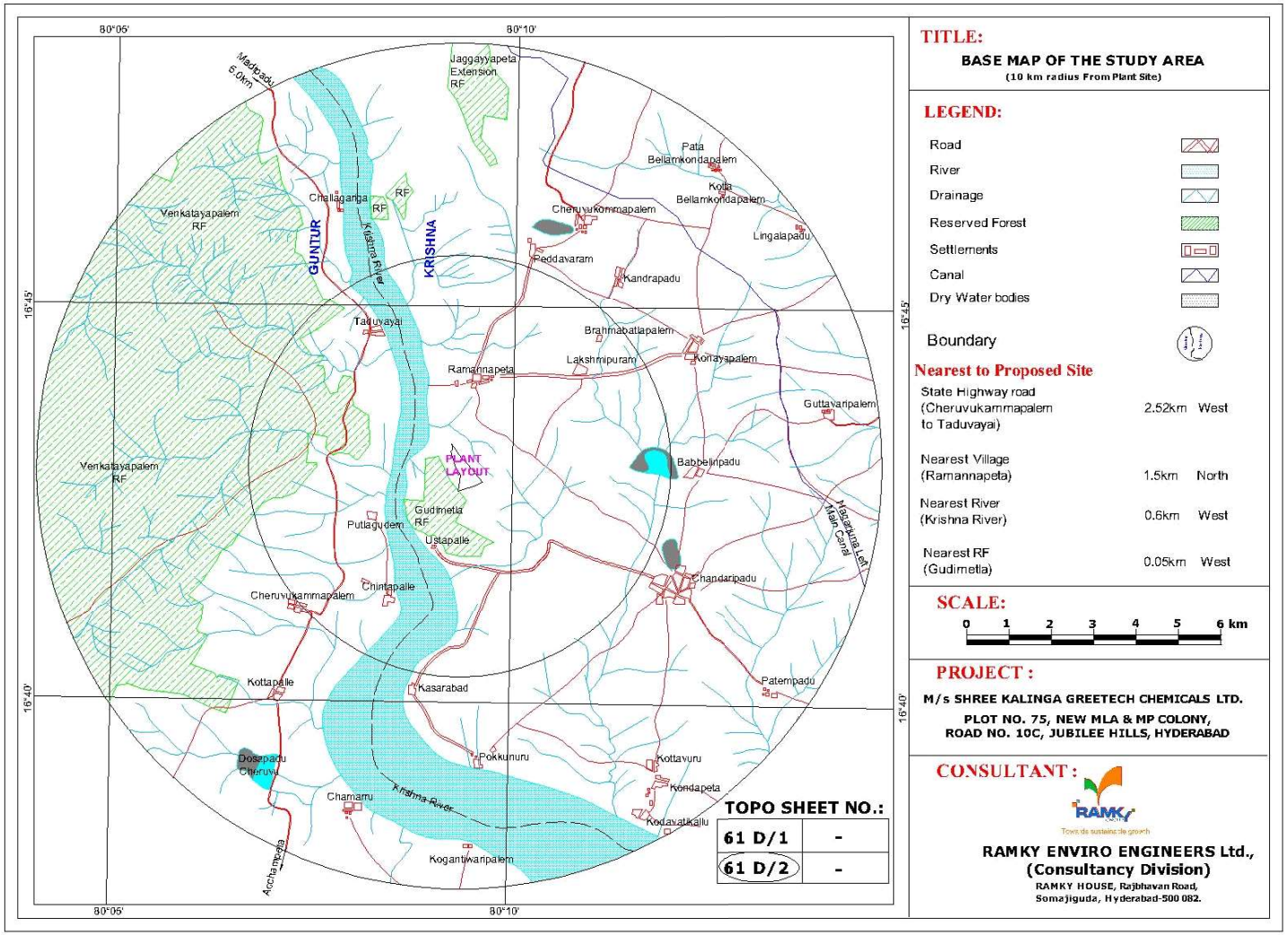


Figure 2.3.3
Plant Layout Map

Figure 2.3.4
Photographs of the Proposed plant Site

Working Guidance on EPA's Section 8(a) Information Gathering Rule on Nanomaterials in Commerce

Important Note:

- This general guidance will not provide answers to all of the potential questions that will arise as manufacturers and processors seek to comply with the rule. Commenters to the draft guidance asked several questions that would require more details or information before EPA could respond to their question.
- If this general guidance does not answer those questions or other questions you have about the rule, please contact Jim Alwood, Chemical Control Division (7405M), Office of Pollution Prevention and Toxics, Environmental Protection Agency, 1200 Pennsylvania Ave. NW, Washington, DC 20460–0001; telephone number: (202) 564–8974; email address: alwood.jim@epa.gov. EPA will answer these questions on a case-by-case basis**.** EPA intends to add further questions/answers and revisions to this guidance based on questions identified by persons who may be subject to the rule.

Section 1: What Chemicals are Reportable?

Question 1: Can you describe what is considered a reportable chemical substance? Is there some way to differentiate between genuinely new nanoscale materials in commerce and traditional products?

Under this rule, a reportable chemical substance is defined as a solid at 25 °C and standard atmospheric pressure, that is manufactured or processed in a form where any particles, including aggregates and agglomerates, are in the size range of 1–100 nm in at least one dimension, and that is intentionally manufactured or processed to exhibit unique and novel properties because of its size. A reportable chemical substance does not include a chemical substance that is manufactured or processed in a form where less than 1% of any particles, including aggregates, and agglomerates, measured by weight are in the size range of 1–100 nm in at least one dimension. This definition focuses on nanoscale materials that are intentionally manufactured or processed to exhibit unique or novel properties because of size in the 1-100 nm range.

The definition of a reportable chemical substance is consistent with the ISO concept of a 'nano-enabled' property. However, EPA does not consider ISO 'nano-enhanced' properties to generally be considered as unique and novel properties.

Question 2: What properties are considered unique and novel?

The rule includes a definition of unique and novel properties. Unique and novel properties are any size-dependent properties that vary from those associated with other forms or sizes of the same chemical substance not in the size range of 1-100 nm, and such properties are a reason that the chemical substance is manufactured or processed in that form or size (the rule therefore includes an element of intent in manufacturing or processing). In order to be reportable it is not

sufficient that a chemical substance contains particles in the size range of 1-100 nanometers; it must also have a size-dependent property different from properties at sizes greater than 100 nanometers, and those properties are the reason that the chemical substance is manufactured or processed in that form or size. The fact that a chemical substance is in the size range of 1-100nm, in at least one dimension, does not in itself mean that the chemical substance is a reportable chemical substance. Size is not considered to be a unique and novel property.

Gold at the nanoscale has novel, size-dependent properties. Intentionally manufacturing or processing nanoscale gold so that it exhibits a red or purple color instead of a yellow color is an example of a unique and novel optical property (in this case, tuned to absorb different wavelengths of light) seen at the nanoscale that is not observed where the particles are larger than nanoscale. In addition, gold exhibits different colors at different sizes *within* the nanoscale. While producing gold at the nanoscale would likely result in concurrent changes of other material properties (i.e. surface area, reactivity, etc.) those other properties are not the reason gold is being manufactured or processed in a nanoscale form. In this example, gold is being produced at the nanoscale for its optical properties, and those are the unique and novel properties.

A chemical substance such as carbon black which doesn't change its color because of its size would not exhibit a unique and novel property on the basis of color, because its nanoscale form is not a different color. Nanoscale carbon black when oxidized by nitric acid is used as a heavy metal sorbent, a property it does not have outside the nanoscale. This unique metal absorbing property of the oxidized form of nanoscale carbon black would meet the definition of a unique and novel property.

Titanium dioxide is an opaque white pigment when particles are greater than 100 nm. It is also an opaque white pigment when particles are less than 100 nm in size. Other nanoscale forms of titanium dioxide are colorless and transparent when manufactured or processed at less than 100 nm in size; this version of titanium dioxide has different functionality than the form greater than 100 nm and has properties which would be considered unique and novel.

Question 3: Can enhanced properties or continuously scaling properties (such as thermal conductivity or surface area) be considered unique and novel properties?

Enhanced or continuously scaling properties are properties which do not intrinsically change on the nanoscale and instead scale proportionately with particle size; this can include increased reactivity, surface area, and thermal conductivity, among others. These are not considered unique and novel properties. See also the answer to Question 5.

An example of a continuously scaling property could be density, which decreases with decreasing particle size. A material may be engineered on the nanoscale such that it has a lower density and remains suspended in solution compared to a corresponding macroscopic sample of the material, but this is not unique and novel as density scales proportionately with particle size. Intentionally manufacturing or processing nanoscale gold to change the thermal conductivity of a dispersion would not be considered unique and novel, as the changes in thermal conductivity with nanoparticle size follow the same behavior as larger particles. A pigment which adds, at all sizes, blue tones to a resin, but the blue tones are more apparent when the

pigment is on the nanoscale (1-100 nm), is an enhanced property. If the pigment only added blue tones when used on nanoscale (1-100 nm) and not at other particle sizes, that would be a unique and novel property.

Question 4: My company manufactures a nanoscale material in the form of primary particles less than 100 nanometers in the reactor system but almost immediately due to van der Waals forces forms aggregates and agglomerates with particle sizes far greater than 100 nanometers(nm). Are these types of nanostructured materials with particle sizes greater than 100 nm considered reportable chemical substances under this rule?

No. The definition of a reportable chemical substance is a combination of particle size and unique and novel properties. For the example given in the question, the form consisting of primary particles at "creation" would not meet the definition of a reportable chemical substance, unless the manufacturer was making a material consisting solely of those primary particles that also exhibit size dependent properties. Because in the example the particle size of the aggregates and agglomerates is greater than 100 nm, that form of material as manufactured is not a reportable chemical substance.

Question 5: Some companies may domestically manufacture or import substances with differing surface areas. The aggregate sizes of some grades may be larger than 100 nanometers and others may have an aggregate size between 1-100 nm. Differing surface area is a reason that these grades are domestically manufactured or imported. In this circumstance, does surface area meet the definition of a "unique and novel property" such that grades having aggregate sizes of 1-100 nm may be reportable under the final rule?

Surface area is not considered a unique and novel property. It will vary proportionately with a smaller particle size. However, if another intrinsic property changes as a result of the smaller particle size/increased surface area, and if that other property is the reason that the substance is manufactured at that particle size range, than that other intrinsic property would be considered a unique and novel property and the material would be reportable.

Question 6: To what objects and collections of objects does the 1-100 nm measurement apply? In other words, does that mean any form with particles 1-100 nm or does that include aggregates and agglomerates greater than 100 nm but based on primary particles less than 100 nm?

The 1-100 nm measurement applies to chemical substances with particles 1-100 nm, but not aggregates or agglomerates greater than 1-100 nm. This applies even if the aggregate or agglomerate contains primary particles less than 100 nm.

Question 7: If a reportable chemical substance is reported as a new chemical for one use but later has a different use from the one reported, would this require reporting under this rule?

Because this rule is one-time reporting of nanoscale forms of chemical substances in commerce, new uses of reportable chemical substances that have been reported previously pursuant to this rule or were previously reported on or after January 1, 2005 as a new chemical do not need to be

reported under this Section 8(a) reporting requirement. However, if a person manufactures or processes a new discrete form of the reportable chemical substance for the new use, then that person would be required to report the new discrete form under this rule. Note that there may be notification requirements unrelated to this Section 8(a) reporting rule if a company manufactures or processes the chemical substance for a use that is subject to a significant new use rule (SNUR) for the chemical substance.

Question 8: Are mixtures ever reportable under this rule? What about aqueous dispersions? The IUPAC definition of emulsions limits them to liquid-in-liquid mixtures, are they therefore exempt?

Mixtures are not required to be reported under this rule. However, any components of the mixture that meet the definition of a reportable chemical substance would be reported. Manufacturing (including import) or processing chemical substances as part of a mixture requires evaluation of each chemical substance in the mixture to determine which, if any, are reportable. Nanomaterials incorporated into emulsions, aqueous dispersions, colloids, and other solid-in-liquid or solid-in-solid mixtures that meet the definition of a reportable chemical substance are reportable. This can also apply to nanomaterials formed in situ, even if not separable from the solvent. Mixtures (including liquid in liquid emulsions) themselves are not reportable – only solid nanomaterials which fit the description of reportable chemical substances which are incorporated into or formed within the mixture, dispersion, emulsion, colloid, etc. are reportable.

Question 9: Is "reporting for mixtures" notifier-specific or substance-specific? For example, if a manufacturer reports and sells to 10 processors, does each processor report?

Reporting for mixtures is not required, but you must report each individual reportable chemical substance in a mixture. Any reportable chemical substance that is incorporated into a mixture or substrate would require reporting for manufacturing or processing of that chemical substance. If a manufacturer sells a mixture containing a reportable chemical substance to multiple processors, then each processor is also required to report the nanomaterial (but not the mixture itself). As an example, a manufacturer who incorporates reportable gold nanoparticles into an emulsion is required to report the gold nanoparticles only, and all processors to which this emulsion is distributed must also report the gold nanoparticles, even if the nanoparticles are never separated from the emulsion.

Question 10: Please clarify the criterion to exclude chemical substances that dissociate completely in water to form ions that are smaller than 1 nm. How fast or what is the rate of dissociation?

The rate of dissociation or how fast that dissociation occurs in water does not affect which chemicals are excluded. If the chemical substance completely dissociates to form ions smaller than 1 nm, it is not a reportable chemical substance.

Question 11: What are the criteria to discern one shape from another shape? At what point is different morphology in nanomaterials reportable? Is every different morphology

of a nanomaterial reportable? What about the natural shape variation within a distribution of nanoparticles?

A different morphology would be any change in the shape of particles. Different morphology does not include random shape changes or natural variation in shapes of particles that are not definitive and that occur in a continuum. Some nanoscale materials are engineered to give all the particles a certain morphology or shape. The change in shape needs to be a specifically engineered change in the shape of particles of a nanoscale material, to effect a change and form a unique and novel property for a chemical substance in the particle size range of 1-100 nm in at least one dimension. For example, colloidal gold nanoparticles have a plasmon resonance which evolves with particle size/diameter, while gold nanorods exhibit two plasmon resonances, which can be tuned precisely by aspect ratio; the change in shape dramatically alters optical properties and each shape is engineered purposefully for those specific optical properties. As the unique and novel property has changed, both forms are discrete and reportable.

Question 12: What does the rule mean by coating? How is coating different from surface treatments?

The term "coating" in the rule describes coating of a reportable chemical substance with another chemical substance. The change in coating makes it a discrete form of a reportable chemical substance subject to reporting, even if all of the other intrinsic characteristics of the reportable chemical substance remain the same. Surface treatments such as oxidation or neutralization of the surface are typically used as preparative or cleaning measures resulting in particles which are not isolated. Such surface treatments therefore do not create a separate reporting requirement.

Question 13: Why are coated nanomaterials defined separately from chemical mixtures? There are cases where discrete nanomaterials are surface treated (commonly coated with polymeric substances) in a similar fashion as defined for chemical mixtures.

Coating a nanoscale material results in a nanoscale material with different properties. The rule does not require that every chemical substance coated with another chemical substance be reported, but only that reportable chemical substances which are coated be reported as discrete substances. The nanomaterial itself remains the reportable chemical substance, not the coating (i.e. report the coating and nanoparticle, not just the coating). Coating does not refer exclusively to full encapsulation of a nanoparticle, but also to discontinuous and random coverage. The concept of "seven standard deviations" to distinguish discrete forms is not applicable here – the particle is either coated or it is not. There is no percentage limit on distinguishing different compositions of surface coating; when the coating imparts differential function from a different coating composition, it is a new discrete form and reportable (assuming the original nanomaterial was also reportable). This could encompass the above example in which a nanomaterial is coated with a polymeric substance – if the nanomaterial was a reportable chemical substance before coating, then coating generates a new discrete reportable form of that nanomaterial. If the coating changes the size of the particle such that there is a new unique and novel property, then that is a new discrete form and it is reportable.

Comment 14: Is it EPA's intention to require reporting on large molecules within the size range of 1 – 100 nm, which are not normally considered to be nanoscale materials (for example, monomers, polymers, colloids, organic and inorganic pigments and dyes, polymer dispersions, etc.)? Are polymers or metals attached to ligands which are larger than 1 nm in size also considered a nanoscale material for reporting?

In order to be a reportable chemical substance, the chemical must not only be a solid particle in the size range of 1-100 nanometers in at least one dimension, it must also have a unique and novel property, which is any size-dependent property that varies from those associated with other forms or sizes of the same chemical substance, and such property is a reason that the chemical substance is manufactured or processed in that form. While these categories of large molecules are not automatically exempt, monomers, polymers, and colloids, organic and inorganic pigments and dyes, and polymer dispersions are not reportable chemical substances unless they are solid particles manufactured or processed at the nanoscale to exhibit unique and novel properties that are not exhibited by other forms or sizes of the same chemical substance. Large molecules and chemicals attached to ligands greater than 1 nm that do not meet the definition do not need to be reported.

Section 2: Who is Required to Report?

Question 15: My company manufactures ink/toner products and is planning to import their products, which include a chemical substance with particle sizes of 1-100 nm, used as a pigment and/or additive in toner and ink cartridges. Is my company required to report even though the chemical substance is incorporated into a formulation that is not manufactured or processed in the United States?

Under TSCA, the definition of manufacture is not limited to domestic manufacture; the definition of manufacture includes import. This includes importing a chemical substance as part of a formulation. The chemicals in the formulation are subject to any manufacturing reporting requirements under TSCA including the reporting and recordkeeping rule for chemical substances that are nanoscale materials. If the chemical substance is imported in a form that meets the definition of a reportable chemical substance, the importer of the toner must report under 40 CFR 704.20.

Question 16: My company is currently processing carbon nanotubes for research and development (R&D). Within the next few years there is a probability that we will be selling products containing the carbon nanotubes. At that point, we would not be exempt from this reporting requirement. Would it be proactive for us to report to the EPA now, even though we are still in the R&D phase, or should we wait until we are processing for production?

On May 12, 2017, EPA published a Federal Register notice extending the effective date of the rule. The rule will become effective on August 14, 2017. By August 14, 2018, you would need to report any non-exempt processing of a reportable chemical substance that occurred before August 14, 2017. If you begin non-exempt processing of a reportable chemical substance after August 14, 2017, you would need to report at least 135 days before commencing manufacture or processing of a discrete form of the reportable chemical substance, except if you have not formed

an intent to manufacture or process at least 135 days before commencing such manufacture (including import) or processing, in which case the information must be filed within 30 days of the formation of such an intent. You are the best judge on when to report to meet the requirement of reporting 135 days before processing a reportable chemical substance or within 30 of forming an intent to manufacture or process.

You will also need to determine if the carbon nanotubes you are processing meet the definition of a reportable chemical substance. Not all carbon nanotubes contain particles less than 100 nm in at least one dimension, although most of them would be described as having unique and novel properties.

EPA considers most forms of carbon nanotubes as new chemical substances (See 73 FR 64946). Are you importing the carbon nanotubes or purchasing the carbon nanotubes from a domestic supplier? Can your supplier confirm they are on the TSCA Inventory? If you cannot confirm they are on the TSCA Inventory, then rather than reporting under this Section 8(a) rule, you may need to submit a pre-manufacture notice (PMN) under TSCA Section 5 for the carbon nanotubes if you are the importer of record, or your domestic supplier may need to submit a PMN. You can learn whether your nanotubes are on the TSCA Inventory by submitting a *bona fide* request to EPA pursuant to procedures in 40 CFR 720.25.

Question 17: What is required of processors who do not know about the nanomaterial-related characteristics of formulations they process or use? Where in the supply chain must a reportable chemical substance be reported: at every point in the supply chain, or only at the point of manufacture? Would this include incorporation into articles and substrates?

Reporting of information under the rule is required only to the extent that information is known or reasonably ascertainable. The term “known to or reasonably ascertainable by” is defined at 40 CFR 704.3. It means “all information in a person’s possession or control, plus all information that a reasonable person similarly situated might be expected to possess, control, or know.” This standard includes, but is not limited to “information that may be possessed by the [submitter], including persons involved in the research, development, manufacturing, or marketing of a chemical substance and includes knowledge gained through discussions, symposia, and technical publications. Examples of types of information that are considered to be in a person's possession or control, or that a reasonable person similarly situated might be expected to possess, control, or know, include files maintained by the submitter, such as marketing studies, sales reports, or customer surveys; information contained in standard references, such as SDSs, that contain use information or concentrations of chemicals in mixtures; and information from the CASRN and from the D&B number.” (Chemical Data Reporting Final Rule 76 FR 50816, 50829).

Under the “known to” portion of the standard, a submitter must ascertain what they know about the manufacturing, processing and use of a chemical substance it manufactures (including imports) or processes, without confining its inquiry to what is known to managerial and supervisory employees. A submitter would also be expected to review other information which the manufacturer (including importer) or processor may have in its possession. This standard requires that submitters conduct a reasonable inquiry within the full scope of their organization (not just the information known to managerial or supervisory employees). The inquiry would be

as extensive as a reasonable person, similarly situated, might be expected to perform within the organization. Information derived from customer surveys or other customer contacts, like any other information, would be "known to" the submitter if it is available after a reasonable inquiry within the organization. The standard does not necessarily require that the manufacturer conduct an exhaustive survey of all employees.

If processors do not know about specific physical properties of chemical substances, they must still take reasonable measures to ascertain the information that would determine whether they are subject to the rule. If processors do not know about specific properties such as particle size and other properties that would allow them to know if they are processing a chemical substance subject to the rule, it would be within the reasonably ascertainable standard to ask their suppliers for information that would enable the processor to determine whether the supplier is selling them a nanoscale material subject to reporting and, if so, provide them with what reportable information they have. Their supplier is not required to provide any additional information to the processor but might provide other supporting information, for example, whether their supplier has reported or intends to report the chemical substance under this rule. If the supplier provides information indicating that the substance is not reportable or if the processor lacks any other means of reasonably ascertaining whether the substance is reportable, the processor does not need to perform tests to determine whether the substance is reportable. No testing is required under this rule.

Information developed in the normal course of business or that the processor chooses to develop must also be used. The processor may want to document the steps they took to determine if reporting was required. Inquiry under the "reasonably ascertainable" portion of the standard may also entail inquiries outside the organization to fill gaps in the submitter's knowledge. Note however, that if particular information cannot be derived or reasonably estimated without conducting further customer surveys (i.e., without sending a comprehensive set of identical questions to multiple customers), it would not be "reasonably ascertainable" to the submitter. Thus there is not a need to conduct new customer surveys for purposes of reporting under the rule. As described above, however, existing customer survey data may nevertheless be "known to" the organization.

Each manufacturer and processor in the supply chain must report reasonably ascertainable information on the reportable chemical substance. Once a chemical substance has been incorporated into an article, no further reporting is required as persons that manufacture or process chemical substances as part of articles are exempt from reporting. Companies that purchase formulations from a source in the United States but do not change or modify those formulations and only use them are not considered processors and are not required to report under the rule. Importers that purchase formulations that contain reportable chemical substances from a source outside the United States are considered to be the same as manufacturers and are required to report under the rule even if they do not change or modify those formulations and only use the formulation.

Each circumstance requires companies to use the reasonably ascertainable standard. The obligations under that standard can be different depending on the situation.

Question 18: Is a processor of a reportable chemical submitted as a PMN required to report?

Only persons who submitted the Section 5 submission after January 1, 2005 are exempt from reporting. Other manufacturers and processors would still be required to report under the TSCA Section 8(a) rule.

Question 19: The physical properties that define discrete forms of a reportable chemical substance sometime cannot reliably be measured and the rule appears to require companies to conduct tests on these or other physical-chemical properties to determine whether they must report. Many of these tests are not commonly performed.

Testing cannot be required under a TSCA Section 8(a) rule. While manufacturers and processors are not required to test for the properties identified in the definition of discrete forms of a reportable chemical substance, they are still required to determine their compliance obligations under the rule based upon information that is in their possession or which is reasonably ascertainable. If information within a company's possession or that is reasonably ascertainable does not demonstrate that the company is manufacturing or processing a discrete form of a reportable chemical substance, there is no obligation to report.

Question 20: What if there is no corresponding bulk material for the manufacturer or processor to use in assessing whether the nanomaterial exhibits unique and novel properties?

In the event that there is no obvious bulk chemical substance for comparison with a nanomaterial, submitters are encouraged to contact EPA for further guidance. This particular situation may require reporting under Section 5 of TSCA as a new chemical substance.

Question 21: If a company manufactures or processes a reportable chemical substance solely for export, is the company subject to the reporting requirements?

Yes. Persons who manufacture or process reportable chemical substances solely for export are subject to the reporting requirements. TSCA Section 12(a) exemptions for export do not apply to Section 8(a) rules. Note, however, that reportable processing and use information is restricted to domestic activities, i.e., within the customs territory of the United States.

Question 22: Are importers of a reportable chemical substance required to report under the rule?

Yes. The definition of "manufacture" under Section 3(9) of TSCA includes import.

Question 23: If the properties change after processing and the chemical is no longer reportable, does the processor still have to report?

If the properties change after processing and the chemical substance is no longer reportable, then the processed substance is no longer reportable. However, the processor would still need to

report available information about how it processed a reportable chemical substance into a non-reportable substance.

Section 3: What information is to be reported?

Question 24: Can you clarify whether manufacturers and processors who are only required to report available or reasonably ascertainable information need to develop information to comply with the rule?

Manufacturers and processors are not required to conduct testing or develop information under this rule. However, they are required to report information that is known or reasonably ascertainable. Manufacturers are likely to know details on how the reportable chemical substance is manufactured, but processors and users are less likely to know the same details. See the answer to Question 17 for detailed discussion about the reasonably ascertainable standard.

Question 25: What are some examples of types of information that are considered to be in a person's possession or control or that a reasonable person similarly situated might be expected to possess, control, or know?

Examples of such types of information include:

- Files maintained by the submitter or employees in the submitter's company, such as marketing studies, sales reports, or customer surveys;
- Information contained in standard references, such as MSDSs, that contain use information or concentrations of chemical substances in mixtures; and
- Identification numbers from the Chemical Abstracts Service (CAS) and from Dun & Bradstreet.

Question 26: A company manufactures or processes chemical substances but often does not know how these chemical substances are used by downstream customers. Does EPA intend for submitters to send questions to customers requesting information about downstream uses?

It depends on what is meant by sending "questions to customers." Submitters need not send out a comprehensive set of identical questions to multiple customers in order to fulfill the reporting standard. That is, they need not conduct a new survey of their customers. However, one way of fulfilling the reporting standard might involve limited inquiries outside the organization (e.g., contacting a major customer or examining that customer's public website) to fill in gaps in the submitter's knowledge, where the submitter's current knowledge is less than what a "reasonable person similarly situated might be expected to possess, control, or know." See 40 CFR 704.3.

Question 27: All of a company's products are used to make commercial products through various process steps by different manufacturers. Should the company provide information about consumer uses even if its chemical substance is not the end use product?

Yes. If the chemical substance is present in a consumer product, the company would still report the information if it is known to or reasonably ascertainable by the company, even if the

company does not manufacture the consumer product. The information provided on the reporting form about downstream use is associated with the processing and use of reportable chemical substances and typically relates to processing or use that is outside of the manufacturing, importing, or processing site, unless, of course, the manufacturer, importer, or processor also processes or uses the reportable chemical substance.

If the chemical substance is not present in the consumer product, then a manufacturer or processor would only need to report that it would be used to manufacture a consumer product to the extent it is known or reasonably ascertainable.

Information on subsequent industrial users and processors and on commercial and consumer uses of the reportable chemical substance would be reported on the reporting form to the extent the information is known to or reasonably ascertainable by the manufacturer (includes import) or processor of the subject chemical substance. A company which is a manufacturer or processor must report information about the distribution and use of the chemical substance that is known to or reasonably ascertainable by the company. To the extent the information is not known or reasonably ascertainable, the company may report NKRA (i.e., "not known or reasonably ascertainable").

Section 4: When is Reporting Required?

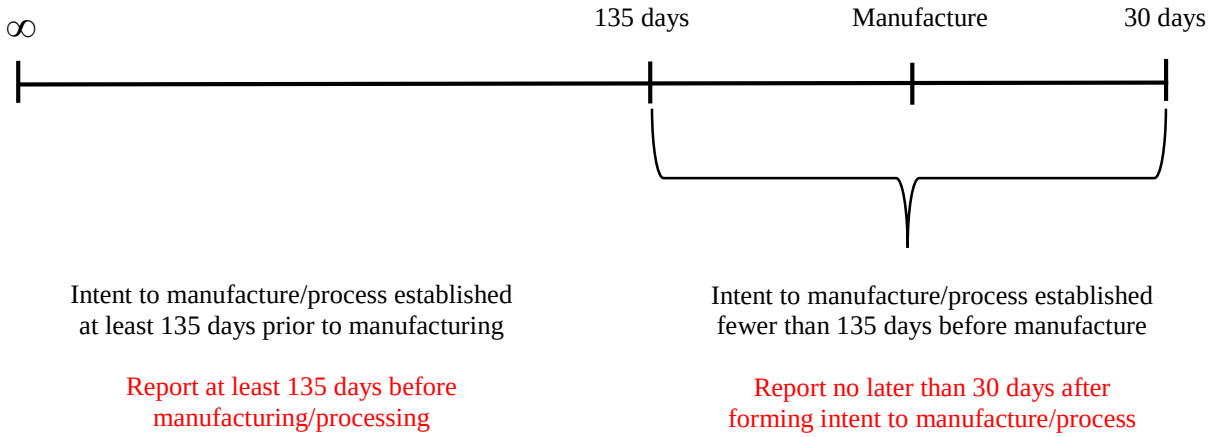
Question 28: Please clarify how the 135-day reporting requirement for new discrete forms would work. For example, can commercialization begin after notification to EPA or after 135 days after notification to EPA?

The 135-day period is not a formal review-period that prohibits manufacture or processing before the end of the 135-day period. Rather, based on EPA's experience with the PMN reviews in the new chemicals program, EPA believes that in most cases companies have the requisite intent to manufacture or process a reportable chemical substance at least 135 days before manufacturing or processing will begin, and the rule requires reporting based upon this presumed intent. However, if a company does not form the requisite intent 135 days ahead of time, the company must report within 30 days of the formation of such an intent. Moreover, if a company desires to begin manufacture or processing earlier than expected after the submission for this rule is made, the company is free to do so. There is no obligation upon the company to wait 135 days after reporting to manufacture or process.

The reporting requirement for discrete forms can be described in two different circumstances:

1) If the company forms the intent to manufacture or process 135 days or more (it is not unusual for companies to form intent 6 months or more in advance) before it manufactures or processes a discrete form: Reporting under the rule would occur at least 135 days before manufacturing or processing.

2) If the company forms the intent to manufacture or process fewer than 135 days before it manufactures or processes a discrete form: Reporting under the rule should occur as soon as possible but no later than 30 days after forming the intent.



A company can begin to manufacture or process the new discrete form any time after it has reported under the rule, because reporting under Section 8(a) does not establish a formal review period or require EPA to make any determination. Any follow-up action under TSCA including more information reporting would require a separate action under TSCA.

Question 29: Is there a mechanism or requirement to update any new information if there is a change in manufacture, processing or use after the initial reporting of a reportable chemical substance?

Because this rule only requires one-time reporting, updating with new information is not required unless the change in manufacture or processing creates a new discrete form of a reportable chemical substance. This would require separate reporting for the new discrete form of a reportable chemical substance.

Question 30: Can EPA clarify if the exemptions for new chemicals reported since January 1, 2005 and the Nanoscale Materials Stewardship Program (NMSP) would exempt information that has changed since the original reporting?

For a reportable chemical substance that was submitted as a new chemical substance under Section 5 of TSCA or as part of the NMSP, no updated information would need to be reported unless a manufacturing or processing change resulted in a new discrete form of the reportable chemical substance.

Question 31: What is the criterion for distinguishing new processing methods for a nanoscale material from existing methods? What would constitute a process change that would require filing a new report?

The type of process change is not the criterion; it is the intent and effect of the process change. Any manufacturing or processing change that is intended to change particle size and properties would be a process change that could result in a reportable chemical substance.

Section 5: General Questions

Question 32: The reporting rule was published in the Federal Register on January 12, 2017. When does this rule become law?

On May 12, 2017, EPA published a Federal Register notice extending the effective date of the rule 90 days; the rule became effective on August 14, 2017.

Question 33: Is there a minimum production volume below which no reporting is required, such as 10 or 100 kg?

There is no exemption based on production volume or reporting threshold based on production volume.

Question 34: (a) Is research and development exempt from reporting under the rule? (b) Can you define small quantities? (c) Can companies sell research and development quantities for profit? (d) Is reporting required if the core commercial activity of a company is research and development?

(a) Yes. As described in 40 CFR part 704.5(e), a person who manufactures (including imports), processes, or proposes to manufacture or process a substance subject to reporting under this rule only in small quantities solely for research and development is exempt from the reporting requirements of the rule.

(b) Small quantities solely for research and development (or ‘‘small quantities solely for purposes of scientific experimentation or analysis or chemical research on, or analysis of, such substance or another substance, including such research or analysis for the development of a product’’) is defined in 40 CFR part 704.3 to mean quantities of a chemical substance manufactured or processed or proposed to be manufactured or processed solely for research and development that are not greater than reasonably necessary for such purposes.

(c) Yes. The exemption may apply even if a company sells research and development quantities for a profit.

(d) The research and development exemption applies to use for which the specific chemical substance is manufactured. It is irrelevant whether the main commercial activity of the company is research and development or industrial sales or use.

Question 35: Are articles exempt from reporting under this rule?

As described in 40 CFR 704.5(a), a person who imports, processes, or proposes to import or process a reportable chemical substance subject to this rule solely as part of an article is exempt from the reporting requirements of this part with regard to that substance. Manufacturers (including importers) or processors of a reportable chemical substance that is incorporated into an article would be required to report any required information for activities before the chemical

substance is incorporated into the article. An article is defined in 40 CFR 704.3 as a manufactured item (1) which is formed to a specific shape or design during manufacture, (2) which has end use function(s) dependent in whole or in part upon its shape or design during end use, and (3) which has either no change of chemical composition during its end use or only those changes of composition which have no commercial purpose separate from that of the article, and that result from a chemical reaction that occurs upon end use of other chemical substances, mixtures, or articles; except that fluids and particles are not considered articles regardless of shape or design.

Question 36: Please clarify on-site use of a reportable chemical (i.e. polishing) vs. those activities that constitute processing?

Processing for commercial purposes is defined in 40 CFR 704.3 as the "preparation of a chemical substance or mixture after its manufacture for distribution in commerce with the purpose of obtaining an immediate or eventual commercial advantage for the processor. Processing of any amount of a chemical substance or mixture is included in this definition. If a chemical substance or mixture containing impurities is processed for commercial purposes, then the impurities also are processed for commercial purposes." On-site use of a formulation containing a reportable chemical substance (i.e. for polishing or purifying other chemicals or articles) when the formulation is unchanged is not reportable. To better clarify when reporting is required, reporting would not be required by persons who *only* use a formulated product or polymer matrix. If someone both processes and uses a formulation with a reportable chemical substance, they would be required to report.

Question 37: Can imported metal powders ever be considered "articles" regardless of their end use?

No. Powders cannot be considered articles. The definition of article includes the statement that "fluids and particles are not considered articles regardless of shape or design".

Question 38: Is the purpose of the rule to compile an inventory of nanoscale material chemical substances in commerce?

No. The purpose of the rule is to collect information on the manufacture (including importation); processing; and industrial, commercial, and consumer uses of certain chemical substances that are nanoscale materials. This rule will allow EPA to obtain basic data from those that manufacture or process existing nanomaterials made from substances that are on the TSCA Inventory. EPA will use information gathered through this rule to inform the Agency's understanding about the manufacture, processing and use of nanoscale substances and to determine if any further action under TSCA, including additional information collection, is needed in specific instances.

Question 39: How do I determine my reporting requirements?

Carefully review the regulations located at 40 CFR 704.20 to determine your reporting requirements. You should consider the following three steps to determine whether you are

required to report for each chemical substance that you domestically manufactured (including imported) or processed in the United States:

- Step I: Is your chemical substance subject to the reporting rule?
- Step II: Are you a manufacturer (including importer) or processor who is required to report?
- Step III: What information must you report?

Question 40: Must a submitter conduct new chemical analyses to report information?

No. The regulation does not require submitters to perform new chemical analyses. The information required by the rule is limited to information that is "known to or reasonably ascertainable." This standard is applicable to all information reported in accordance with 40 CFR 704.20. Testing is not required under this regulation.

Question 41: What should a company do if it determines that it manufactures or processes a chemical substance that is not included on the TSCA Inventory?

In order to manufacture (including import) or process a chemical substance for a non-exempt commercial purpose, it must be: on the TSCA Inventory, a naturally occurring chemical substance as defined by TSCA (see 40 CFR 710.4(b)), or excluded by TSCA Section 3(2)(B). You can visit Substance Registry Services to determine whether your chemical substance is on the TSCA Inventory. If your chemical substance is not on the TSCA Inventory, you may need to submit a PMN to the new chemicals program. Please see EPA's PMN Requirement flowchart to determine if a notice must be submitted to the Agency prior to manufacture (including import). See: https://www.epa.gov/reviewing-new-chemicals-under-toxic-substances-control-act-tsca/basic-information-review-new#who notifies. You can also phone the TSCA Hotline at (202)-554-1404 for assistance.

For a chemical substance that is not on the TSCA Inventory, a person must submit a notice as per 40 CFR 720.22(a)(1) prior to manufacture (including import), with certain exceptions, such as a naturally occurring chemical substance as defined by TSCA, or a chemical exempted excluded from the definition of "chemical substance" in TSCA Section 3(2)(B). See Question 42, below, for a discussion of chemicals excluded from TSCA.

If a person is manufacturing (including importing) a substance which is not on the TSCA Inventory and has not provided the required notice to EPA, each day of such manufacture or importation is a violation of Section 5 of TSCA and could subject the person to enforcement action. If a person finds that it has or may have manufactured a chemical substance in violation of TSCA, contact the Agency by following the instructions at: https://www.epa.gov/compliance/epas-edisclosure.

Significant reductions in penalties may be given to persons who voluntarily disclose such information. Note, however, that continued manufacture, (including importation) or use of such chemical substances remains in violation per Section 15 of TSCA, even after a person has contacted EPA, until the requirements of TSCA Section 5 have been met. These reporting requirements are distinct from the requirements at 40 CFR 704.20.

Question 42: If a company manufactures an otherwise reportable chemical substance for a non-TSCA use, is the company required to report under 40 CFR 704.20?

Substances exempted in TSCA Section 3(2)(B) need not be reported. Substances exempted in TSCA Section 3(2)(B) include: any pesticide as defined by the Federal Insecticide, Fungicide, and Rodenticide Act, when manufactured, processed, or distributed in commerce for use as a pesticide (but see Question 43 below regarding intermediates in the manufacture of an active ingredient in a pesticide); any food, food additive, drug, cosmetic, or device, as defined by the Federal Food, Drug, and Cosmetic Act, when manufactured, processed, or distributed in commerce for use as a food, food additive, drug, cosmetic or device; tobacco or any tobacco product; any source material, special nuclear material, or byproduct material as such terms are defined in the Atomic Energy Act of 1954; and, any article the sale of which is subject to the tax imposed by Section 4181 of the Internal Revenue Code.

Question 43. A company manufactures Chemical C. Its customers use Chemical C for a variety of uses, including as an intermediate in the manufacture of a chemical substance to be used as a pesticide active ingredient. Pesticides are exempt from regulation by TSCA. Does the company need to report industrial processing and use data for this chemical substance?

Yes. The manufacture of a chemical substance that is a pesticide intermediate is manufacture under TSCA.

Question 44: If a company manufactures or processes a reportable chemical substance which may be used for purposes regulated by TSCA and also for uses which are excluded from regulation under TSCA Section 3(2)(B), should the entire quantity that the company manufactures or processes be reported in the submission?

No. Report the manufactured or processed quantity intended for the TSCA use and do not report the quantity that is exempt from TSCA in Section 3(2)(B).

Question 45: Are small manufacturers and processors exempt from reporting requirements of the rule?

Yes. A small manufacturer or processor is defined in the rule as any manufacturer or processor whose total annual sales, when combined with those of its parent company (if any), are less than $11 million. When total annual sales exceed this value, the manufacturer or processor is no longer considered a small manufacturer or processor and would now be subject to the requirements of the rule.

Question 46: What role does the technical contact play?

The technical contact is the person whom EPA may contact for clarification of the information in a submission. The technical contact should be a person who can answer questions about the reported chemical substance(s). Typically, a person located at the manufacturing or processing

site is best able to answer such questions. However, companies may use their discretion in selecting a technical contact or multiple technical contacts. Submitters should consider, in selecting the technical contact, that EPA may have follow-up questions about a submission one or more years after the submission date. The technical contact need not be the person who signs the certification statement.

Question 47: When is the electronic reporting tool going to be available? Will EPA develop user guidance for the new CDR reporting module?

The reporting tool will be available when the rule becomes effective. There will be user guidance for the reporting module.

Question 48: Are joint submissions between manufacturers and processors going to be possible? Will consolidated submissions be permitted?

The electronic reporting tool does not currently allow manufacturers and processors to report jointly on one submission. It will allow additional companies to add support information to a submission not known to a manufacturer or processor if companies want to work together on a submission. EPA will work on adding functionality for joint submissions if companies are interested in that option. The electronic reporting tool does allow for consolidated submissions.

Please contact the EPA for additional details or specific questions regarding adding support information by companies other than the notification submitter. For consolidated submissions please contact EPA before submitting so that EPA can approve the number of reportable chemical substances in one submission and the reason for grouping certain reportable chemical substances.

Question 49: How do I identify a reportable chemical substance if I don't know the chemical identity or if I don't know the CAS number?

The reporting tool will allow companies that are reporting to use generic names or trade names if they do not know the chemical identity. A CAS number will not be required on the reporting form in such cases. If this information is known to or reasonably ascertainable by a company, then they are required to report it on the form.

Question 50: Can EPA clarify or give examples of the meaning of intent to manufacture or process?

A manufacturer or processor of a reportable chemical substance intends to manufacture or process a reportable chemical substance when it has begun one or more of the actions necessary to engage in that commercial activity. Below are some examples that would indicate an intent to manufacture or process a reportable chemical substance. These are not the only indications of an intent to manufacture or process a reportable chemical substance. These examples were identified by one of the commenters to this guidance.

- A company completes R&D efforts and begins efforts to scale up from a pilot process to a full-scale operation to enable the production or processing of a reportable chemical substance.

- A company executes a contract, purchase order, or similar document with a supplier which provides for delivery of a reportable chemical substances for use by the company.

- A company enters an agreement for delivery of a product that will incorporate a reportable chemical substance.

- A company makes significant modifications to its operations, processes and/or its production equipment to accommodate use of, or to generate, a reportable chemical substance.

- A company is taking steps to fulfill a request from a supplier or a customer which provide specifications to be followed to produce or process a reportable chemical substance.

Section 6: Confidentiality

Question 51: What are the requirements for submitting confidential information under the rule?

Information submitted under the rule may be claimed as confidential at the time it is submitted. Submitters must provide upfront substantiation of confidentiality claims for processing and use information as well as for confidentiality claims for site or chemical identity. See §704.20(h) of the rule, and EPA guidance on asserting confidentiality claims at https://www.epa.gov/tsca-cbi.

Question 52: What must generally be considered in making a claim of confidentiality under TSCA?

EPA's procedures for processing and reviewing confidentiality claims are set forth at 40 CFR part 2, subpart B and 40 CFR 704.20(h). TSCA, as amended by the Frank R. Lautenberg Chemical Safety for the 21st Century Act, requires that for all claims for protection for any confidential information made with this submission, the submitter certify they have:
(i) taken reasonable measures to protect the confidentiality of the information;
(ii) determined that the information is not required to be disclosed or otherwise made available to the public under any other Federal law;
(iii) a reasonable basis to conclude that disclosure of the information is likely to cause substantial harm to my competitive position; and
(iv) a reasonable basis to believe that the information is not readily discoverable through reverse engineering. 15 U.S.C. 2613(c).

For further information about EPA's interpretation of confidentiality claims see Statutory Requirements for Substantiation of Confidential Business Information Claims Under the Toxic Substances Control Act (82 FR. 6524) (Jan. 19, 2017).

Question 53: Can companies reporting under the rule make and substantiate confidential business information claims for responsive information known to the submitter but belonging to suppliers or customers and provided under a non-disclosure agreement or a similar arrangement?

EPA considers third party confidentiality claims to be potentially within the ambit of the 704.20(h)(iii) statement regarding disclosure causing substantial harm to the competitive position of the person reporting.