Dalmia Cement (Bharat) Limited

Proposed Modernisation & Expansion of DCBL Dalmiapuram Cement Plant

Production of Lines I & II	Existing EC Qty. (& Consent Qty.)	Addition on Expansion	Cumulative	Percentage Increase
Clinker	2.410 MTPA (2.304 MTPA)	0.820 MTPA (with Modernisation and Upgradations)	3.230 MTPA	34.02%
Cement	4.020 MTPA (3.40 MTPA)	1.794 MTPA	5.814 MTPA	44.63%
CPPs I & II	1x27 MW 1x23 MW	-	50 MW	-

Village-Palanganatham, Taluk & District-Ariyalur, Tamil Nadu

Earlier EC Reference

MoEFCC F. No. J-11011/68/2004-IA II (I) dated 27.04.2005

EC under EIA Notification 2006
Schedule Sl. No. 3(b); Category 'A'

Application to Determine TOR

Application/Form-1

Project Feasibility Report

May 2019

Dalmia Cement (Bharat) Limited

Proposed Modernisation & Expansion of DCBL Dalmiapuram Cement Plant

Project Feasibility Report

(As per MoEF Guidelines vide Circular No. J-11013/41/2006-IA.II(I) dated 30.12.2010)

1.0 Executive Summary

M/s. Dalmia Cement (Bharat) Limited (DCBL) had established our Dalmiapuram Cement Plant in the year 1939 (Pre-Independence & Pre-EIA Notification, 1994 Periods) and are operating the Plant for the last eight decades with rich experience and heritage.

Dalmiapuram Cement Plant is located in an extent of 48.82.5 Ha falling in Survey Nos. 9, 10, 11, 12, etc. in Palanganatham Village, Ariyalur Taluk and District and Survey Nos. Parts of 273, 284, 285, etc. and the Township in Kallakudi Village, Lalgudi Taluk of Trichy District in Tamil Nadu State. The Township with 640 Quarters in an extent of 16.90 Ha (41.75 Acres) near the Cement Plant is with a Hospital, Co-operative Society, Dairy Farm, Dalmia HSS (1,650 Students) & Matriculation School (650 Students), ITI (144 Students), etc. at Dalmiapuram.

At Dalmiapuram, the Polysius Kiln of 250 TPD had been firstly established and the Cement production commenced 01.12.1939. Then, Line-I (KHD Kiln of 3,000 TPD and Upgraded to 3,500 TPD) was installed in the Year 1987. Line-I Cement Production was enhanced from 1.0 MTPA to 1.2 MTPA in the Year 1997-98 after obtaining the Environmental Clearance (EC) from MoEF. Line-II (FLS Kiln of 4,000 TPD) has been installed along with 1x27 MW CPP in the Year 2005-06. The CPP has been expanded with another 1x23 MW in the Year 2008 to cater the Cement Plant. Line-II is in operation since February 2006. As the Plant is located with physical barriers along its Boundaries, the Plant activities including its Expansion activities are restricted to the existing Premises only i.e. its Land Extent cannot be increased.

DCBL has complied with all conditions stipulated in the EC. The Monitoring Cell of MoEF&CC, South Eastern Zone, Chennai has issued the Certified EC Conditions Compliance Report for the Plant vide Letter F. No. EP/ 12.1/376/TN/0469 dated 28.03.2018.

Though, EC has been obtained from MoEF for 2.41 MTPA Clinker and 4.02 MTPA Cement productions, with old Polysius Kiln not in operation, Dalmiapuram Cement Plant is now being operated for the Consented quantity of 2.304 MTPA Clinker and 3.40 MTPA Cement. Various Grades like Ordinary Portland Cement (OPC; 43 & 53 Grades), Portland Pozzolana Cement (PPC), Portland Slag Cement (PSC), Oil Well Cement, Sulphate Resisting Portland Cement, Special Cement, etc. are manufactured at Dalmiapuram Cement Plant.

Presently, there are **773 Employees working in the Cement Plant** and another **141 Employees working in the Power Plants** (including Contract Workers), thus, **total 914 Employees** at Dalmiapuram. The Plants also generate about 500 Indirect Employments.

As the old Line-I (KHD Kiln) and decade old Line-II (FLS Kiln) need modernisation with State-of-Art Technology, DCBL proposes the improvement of the existing Pyro Processing Systems, modernization of the machineries and also Pollution Control Measures upgradation to achieve PM emission <30 mg/Nm^3 and other Pollutant Levels within the stipulated Norms. The Project Cost will be Rs.76.11 Crores.

Due to the Modernisation and Upgradation measures, the **Clinker Production** will be increased from exiting **2.410 MTPA to 3.230 MTPA** and accordingly, the **Cement Production** will also be increased from existing **4.020 MTPA to 5.814 MTPA**. Also, with proposed Composite Cement production, the proposed 5.814 MTPA with 3.230 MTPA Clinker is easily achievable.

The Modernisation and Expansion activities **are proposed within the existing Industry premises** and therefore, no alternate site has been considered.

Adequate Air Pollution Control Measures (APC) measures to control PM emissions are provided in the Cement Plant viz. Electrostatic Precipitators to Clinker Cooler & Boilers, Bag House to Raw Mill/Kiln, Coal Mill, Cement Mill, etc. to control **PM emission <30 mg/Nm^3**. The dust collected from Bag House/Filters, etc. are totally recycled in the process for cement manufacturing.

The total water requirement for the Cement Plants, Captive Power Plants and Colony is 2567 KLD (average) out of which fresh water demand is 2,225 KLD. This requirement of water is presently drawn from Coleroon River through the existing water supply system to the plant. The **additional water demand of 480 KLD** will also be met from the permitted source only and **within the permitted 3,200 KLD**.

The Cement Plant, CPPs and Township generate about 352 KLD Domestic Sewage. The Domestic Sewage from the Plants are collected in about 21 Septic Tanks (Collection Tanks) and the overflow is transported and treated in a Combined 500 KLD Sewage Treatment Plant (STP) in the Colony and the Treated Sewage of 342 KLD is fully utilized for Green Belt Development and Dust Control Measures.

The Cement Plant (277 KLD) & CPP (230 KLD) generate about 507 KLD trade effluents as Boiler and Cooling Tower Blowdowns and RO/DM Plants Rejects. The total **507 KLD effluents from CPP** are treated in a 500 KLD ETP, in Batch Process @ 255 KLD/Shift in 2 Shifts, and the Treated Effluent is pumped to the Cement Plant for Cooling of Cement Plant Machineries and Dust Control Measures. Thus, "**Zero Effluent Discharge**" is practiced at the Complex.

No change in the Quantity of Solid Wastes Generation, Storage and its Disposal due to the proposal.

There are no eco sensitive areas like National Parks, Wildlife Sanctuaries, Reserved Forests, Biosphere Reserves, Elephant Corridor, Mangroves, Archaeological/Historical Monuments, Heritage Sites, etc. within 10 km from the Plant boundary. **Karaivetti Bird Sanctuary** is located at a distance of 8.9 km and its Buffer Zone at 8.1 km in East-northeast.

The Modernisation and Expansion activities are proposed within the existing Plant Premises with no additional land and, no major Construction for the additional Clinker and Cement Production. As per the Environmental Impact Assessment Notification 2006, all Cement Plants with >1.0 MTPA capacity have been kept at Sl. No. 3 (b) under Category "A" for the Environmental Clearance from the Ministry of Environment, Forest and Climate Change (MoEF&CC). Accordingly, DCBL is submitting the Form-1/TOR Application, Feasibility Report and other required Documents for to the Ministry to determine TOR for the EIA Study.

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2.0 Introduction of the Project

2.1 Project Proponent

M/s. Dalmia Cement (Bharat) Limited (DCBL) have Cement Plants at Dalmiapuram & Ariyalur in Tamil Nadu, Kadapa in Andhra Pradesh, Belgaum in Karnataka and Cement Units across Northeast & Eastern Regions. DCBL's Cement manufacturing capacity is now about 31 Million Tonnes per Annum (MTPA).

DCBL had established **Dalmiapuram Cement Plant** in the **year 1939** (Pre-Independence & **Pre-EIA Notification, 1994 Period**). DCBL is operating the Plant for the last eight decades with rich experience and heritage.

DCBL has also established a green field Cement Plant of 3.0 MTPA cement capacity at Tamaraikulam in nearby Ariyalur District at a distance of 35 km from Dalmiapuram.

The Cement Dispatch from these two Cement Plants is fulfilling about 55-60% of the local demand of Tamil Nadu and balance 40-45% is marketed in others States of India.

The total Limestone demand of both Dalmiapuram and Ariyalur Plants is around 20,000 TPD. The limestone requirement of both Cement Plants is being met from the Captive Limestone Mines (**combined Limestone Production of 7.05 MTPA**) in Ariyalur & Trichy Regions viz. Kallakudi & Kovandakurichi (KLK-KVK) Mines, Periyathirukonam (PTK) Limestone Mines and amalgamated Periyanagalur, Aminabad & Khairulabad (PNR Group) Limestone Mines (Regional Map as **Plate I**). Production Enhancement of these Captive Mines are proposed and prior EC Applications are being prepared.

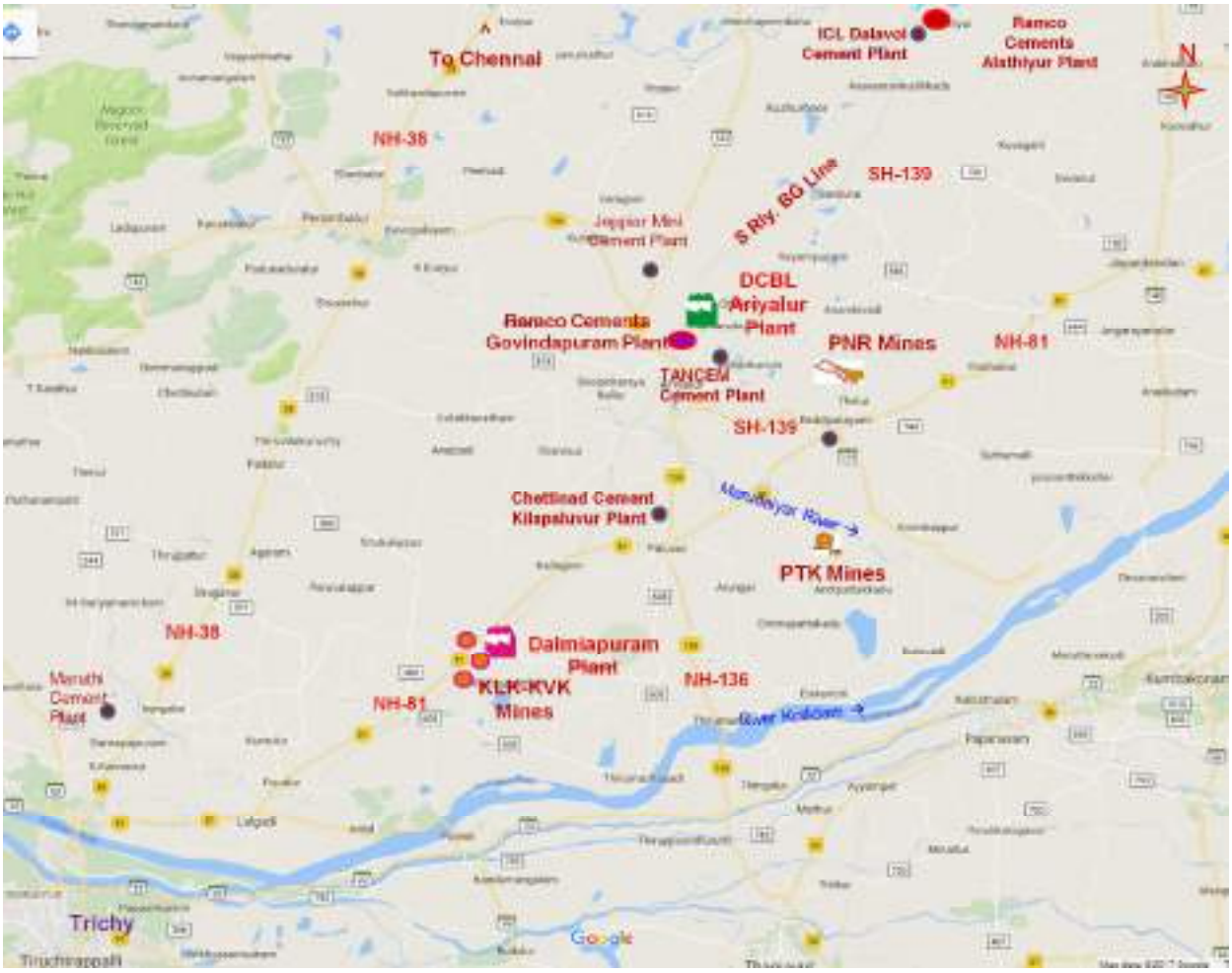
DCBL Dalmiapuram & Ariyalur Cement Plants and the Captive Mines are headed by the **Executive Director** who also deals with the environmental issues and EC compliances. **DCBL has the well laid down Environmental Policy** approved by its Board of Directors. The Integrated Policy of DCBL commits the compliance to all applicable legal requirements. DCBL has the standard operating process or procedures to bring into focus of any deviation/violation of environmental or any other norms or conditions. Any **non-compliance/violations of environmental norms and the corrective actions taken will be reported** by the Executive Director to the Managing Director and the Board of Directors of DCBL.

The communication address is as follows :

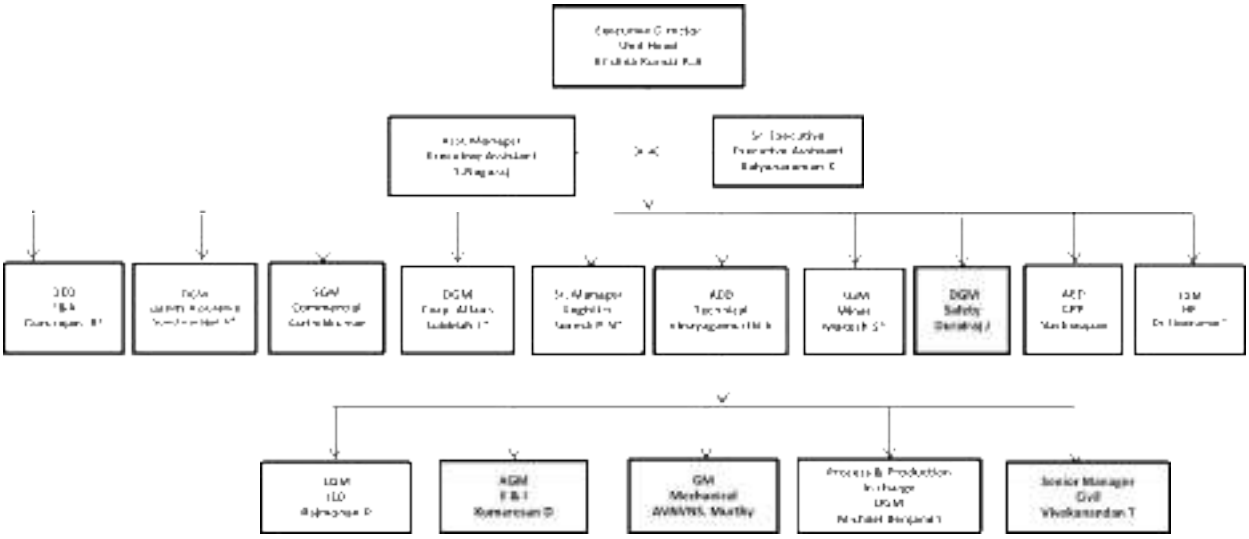
The Executive Director & Unit Head,
Dalmia Cement Bharat Limited,
Dalmiapuram,
Lalgudi Taluk,
Tiruchirapalli District,
Tamil Nadu-621 651.

Telephone Nos. : 04329 - 235123
Fax : 04329 - 235111
Telegraph : DALMIACMNT
e-mail : ra.krishnakumar@dalmiacement.com

Plate : I Location of Dalmia Cement Plants and Mines in Ariyalur Regional Map



Organisation Chart is appended.



DCBL has obtained **ISO:9002 Certification** (in 1993; First in South India and Second in India) for its products, has always stood for the highest quality cements for over seven decades. Recognizing DCBL as Centre of Excellence for transfer of technology, **World Bank** and Danish International Development Agency (DANIDA) Team sponsored a **Regional Training Centre** at Dalmiapuram to cater the needs of South Indian Cement Industries since 1991. DBCL has obtained **ISO:14001** Certification from BIS in the Year 2004.

DCBL has also bagged various National Awards as detailed below :

- Best Improvement in Electrical Energy Performance-**National Award for Energy Efficiency** in Indian Cement Industry by National Council for Cement and Building Materials in the Year **1999 & 2002**.
- A **National Award for Environmental Excellence in Limestone Mines** in Indian Cement Industries by National Council for Cement and Building Materials in the Year **2000-01**.
- First Place in Energy Conservation in the Cement Sector-**National Energy Conservation Award** by Bureau of Energy Efficiency, Ministry of Power, New Delhi in **2001 & 2002**.
- **Best Improvement in Thermal Energy Performance** (**2002**) and National Award for **Best Electrical Energy Performance in Indian Cement Industry** (**2003**) by National Council for Cement and Building Materials.
- Chosen by Confederation of Indian Industry (CII) as a **Model Plant for Energy Efficiency** in Year **2003**.
- **Leadership & Excellence Award in Safety, Health & Environment**-Awarded by CII in the Years **2003 & 2004** - Commendation in SHE Performance.
- A National Award for **Second Best Environmental Excellence in Plant Operation** in Indian Cement Industries (**2003-04**) by NCCBM.
- DCBL Human Resource team was recognized by Hewitt as **9th Best Employer** in the manufacturing sector-2009.
- Second place in the Manufacturing Today **'MT Awards for Excellence in Human Resources-2012'**-Large Enterprises.
- CII-ITC **Sustainability Award 2012** - for contributions to sustainability and conservation of the environment.
- First Prize in Overall Performance by DGMS - Won by Dalmiapuram Mines.
- **ITC Sustain Award** from CII in 2014.

- **ETTS Award** from CII in 2015.
- **5-Star Award for the Mine Operations** at Dalmiapuram.
- **Green Pro Award** from CII in 2016.
- **Energy Excellence Award** from CII in 2016.
- **5S Certification** ‘DQCFL & ABK - AoTS.
- **Green Award by Tamil Nadu State Government** for the Year 2016.

2.2 Identification of the Project

2.2.1 DCBL Dalmiapuram Cement Plant

Dalmiapuram Cement Plant is located in an extent of **48.82.5 Ha** falling in Survey Nos. 9, 10, 11, 12, etc. in Palanganatham Village, Ariyalur Taluk and District and Township in Survey Nos. Parts of 273, 284, 285, etc. in Kallakudi Village, Lalgudi Taluk of Trichy District in Tamil Nadu State (**Fig. 1.1**). The **Township with 640 Quarters** in an extent of **16.90 Ha (41.75 Acres)** near the Cement Plant is with a Hospital, Co-operative Society, Dairy Farm, Dalmia HSS (1,650 Students) & Matriculation School (650 Students), ITI (144 Students), etc. at Dalmiapuram.

At Dalmiapuram, the Polysius Kiln of 250 TPD had been firstly established and the Cement production commenced **01.12.1939**. Then, **Line-I** (KHD Kiln of 3,000 TPD and Upgraded to 3,000 TPD) has been installed in the **Year 1987**. **Line-I Cement Production was enhanced** from 1.0 MTPA to 1.2 MTPA in the **Year 1997-98** after obtaining the Environmental Clearance (EC) from MoEF. Line-II (FLS Kiln of 4,000 TPD) has been installed along with 1x27 MW CPP in the Year 2005-06. The CPP has been expanded with another 1x23 MW in the Year 2008 to cater the Cement Plant. **Line-II is in operation since February 2006**.

The Plant had been established in the Year 1939 with the Southern Railway Line along its Eastern Boundary, Ceramic Factory in its North, DCBL Township in the West and Ariyalur-DPM-Trichy Road along its Southern boundary. As the **Plant is located with physical barriers along its Boundaries**, the Plant activities including its Expansion activities are restricted to the existing Premises only i.e. its Land Extent cannot be increased. That’s why, in addition to the Green Belt & Lawns developed within the Plant, Green Belt has been developed outside the Premises in own lands, as directed by the Ministry. The present Land Use at the Plant Site is as detailed in **Table 2.1**.

Table 2.1 Present Land Use

Land Use	Land Extent, Ha			Percentage to Total Extent
	Cement Plant & CPPs	Township	Total	
Builtup Area	18.602	6.257	24.859	37.82%
Others-Solid Waste Handling, etc.	1.700	-	1.700	2.59%
Green Belt & Lawns	5.349	9.746	15.095	**22.97%**
Railway Siding, Roads & Parking Areas	12.550	-	12.550	19.09%
Vacant Area	10.624	0.897	11.521	17.53%
Grand Total	**48.825**	**16.90**	**65.725**	**100%**
Green Belt ‘DOutside Plant Area	-	-	22.750	**-**
Total Green Belt for the Plant	-	-	**45.72**	**51.68%** (in Total Area of 88.485 Ha)

Dalmia Cement (Bharat) Limited
Modernisation of Dalmiapuram Cement Plant
Fig. : 1.1 Index Map

Tamil Nadu State in India

Ariyalur & Trichy Districts in Tamil Nadu

DCBL Ariyalur Cement Plant Location

Though, EC has been obtained from MoEF for 2.41 MTPA Clinker and 4.02 MTPA Cement productions, with **Polysius Kiln not in operation**, Dalmiapuram Cement Plant is now being operated for the Consented quantity of **2.304 MTPA Clinker and 3.40 MTPA Cement** as detailed in **Table 2.2**.

Table : 2.2 Existing Production of Dalmiapuram Plant

Production of	Production as per Awarded ECs			Existing Production as per TNPCB CTO			Remarks
	Line-I	Line-II	Total	Line-I	Line-II	Total	
Clinker	1.090	1.320	2.410	0.984	1.320	2.304	No prodn. from old Polysius Kiln now
Cement	1.820	2.200	4.020	1.200	2.200	3.400	
Captive Power	-	1x27 MW 1x23 MW (as Expn.)	50 MW	-	1x27 MW 1x23 MW (as Expn.)	50 MW	-
Standby DG Power	2x2 MW & 2x4MW						

Various Grades like Ordinary Portland Cement (OPC; 43 & 53 Grades), Portland Pozzolana Cement (PPC), Portland Slag Cement (PSC), Oil Well Cement, Sulphate Resisting Portland Cement, Special Cement, etc. are manufactured at Dalmiapuram Cement Plant.

Presently, there are **773 Employees working in the Cement Plant** and another **141 Employees working in the Power Plants** (including Contract Workers), thus, **total 914 Employees** at Dalmiapuram. The Plants also generate about 500 Indirect Employments.

Captive Limestone Mines : The Captive Limestone Mines of DCBL in Trichy and Ariyalur Regions and their contribution to Limestone Demand of the Plants are given in **Table 2.3**.

Table : 2.3 DCBL Captive Limestone Mines & their Existing Production

Mine Group	Extent, Ha	Consented Production Capacity, MTPA	Percentage of Supply
Kallakudi & Kovandakurichi Ţ Local Mines Group (5 Leases)	191.265	2.95	45%
Periyanagalur, Aminabad & Khairulabad Mines (PNR Group) (3 Leases)	167.605	1.90	30%
Periyathirukonam Mines (PTK Group; 2 Leases)	106.070	2.20	25%
Total	**464.940**	**7.05**	100%

The existing Plant & Its Environs in High Resolution Satellite Imagery is shown in **Plates II & III**. Existing Layout is appended as **Plate IV**.

Plate : II Dalmiapuram Cement Plant and its Captive Mines in HRS Imagery

Plate : III Dalmiapuram Cement Plant & its Environs






Plate : IV Existing Layout

2.2.2 Statutory Clearances & their Compliances

The ECs obtained from the Ministry of Environment, Forests and Climate Change (MoEF&CC) and Consents granted by Tamil Nadu Pollution Control Board (TNPCB) are given in **Table 2.4** and **Table 2.5** respectively.. The maximum production of Dalmiapuram Cement Plant was **3.37 MTPA cement** during **2008-09**.

Table : 2.4 Dalmiapuram Cement Plant EC Details

EC for	EC Reference	Document Reference
Polysius Kiln & KHD Kiln (Line-I)	Existing Plants before EIA Notification 1994	-
Line-I Cement Plant Expansion from 1.0 MTPA to 1.2 MTPA Cement	MoEF F. No. J-11011/ 104/96-IA II dated 28.08.1997	**Doc-1**
Dalmiapuram Line-II (Increased Clinker by 1.32 MTPA & Cement by 2.2 MTPA from existing 1.09 MTPA Clinker & 1.82 MTPA Cement) along with 1x27 MW CPP	MoEF F. No. J-11011/ 68/2004-IA II (I) dated 27.04.2005	**Doc-2**
Expansion of CPP with additional 1x23 MW	MoEF F. No. J-13012/12/2007-IA.II(T) dated 17.05.2007	**Doc-3**

Certified Compliance to EC Conditions :

The Monitoring Cell of MoEF&CC, South Eastern Zone, Chennai has **issued the Certified EC Conditions Compliance Report** for the Plant vide Letter F. No. EP/ 12.1/376/TN/0469 dated 28.03.2018 (**Doc-4**). **DCBL has complied with all conditions stipulated in the EC**.

Table : 2.5 Dalmiapuram Cement Plant Consent Details

TNPCB Orders	Water Act	Air Act	Consents Date	Production Qty.
Line-I Expn. CTOs	8478	5887	22.06.2001	Clinker : 82,000 TPM Cement : 1,00,000 TPM
Expn.-Line-II; CTEs	3006	2952	06.05.2005	Clinker : 2,35,000 TPM Cement : 3,75,000 TPM CPP : 27 mW
Initial CTO-Line-II with 27 MW CPP	20556	16589	28.02.2006	Clinker : 2.304 MTPA Cement : 3.40 MTPA CPP : 27 MW
Current CTOS-Cement Plant **Docs-5 & 6**	1808112096862	1808212096862	14.12.2018	Clinker : 2.304 MTPA Cement : 3.40 MTPA **Valid till 31.03.2019**
Current CTOS-Captive Power Plants **Docs-7 & 8**	1808112125780	1808212125780	14.12.2018	Clinker : 2.304 MTPA Cement : 3.40 MTPA **Valid till 31.03.2019**

TNPCB Authorisation under Hazardous and Other Wastes (Management and Transboundary Movement) Rules 2016 has been obtained vide Authorisation No. 17HFC6701543 dated 23.05.2017 **(Doc-9**) valid till 31.05.2022.

The **Unit has not received any Notice under Section 5 of the Environment (Protection) Act, 1986 or Show Cause Notices from TNPCB under Air and Water Acts**. There is **no litigation** against the Project.

CREP Compliance : A series of industry specific guidelines are formulated in the Charter on Corporate Responsibility for Environmental Protection (**CREP**) and action points are also enlisted for the Cement Industry. DCBL Plant activities are in compliance with the **CREP Guidelines** (**Table 2.6**).

Table : 2.6 Compliance to CREP Guidelines

No.	Action Points in CREP	Compliance Status
1	Implementation of standards in non-complying units.	Air Pollution Control Equipments are installed in order to meet the emission norms of <30 mg/Nm^3.
2	Plants in critically polluted or urban area (5 km distance outside urban boundary) will meet 100 mg/Nm^3 SPM emission and continue working to reduce the emission of particulate matter to 50 mg/ Nm^3.	The Cement Plant is being operated for PM emission Norm of <30 mg/Nm^3.
3	The new cement kilns to be accorded NOC/EC for complying 50 mg/Nm^3 emission limit.	The PM emissions from the Plant is within the emission norm of <30 mg/Nm^3.
4	CPCB will evolve load based standards by June 2004.	The Load based emission is computed to be less than 0.125 kg/ tonne of Clinker.
5	CPCB and NCBM will evolve SO_2 and NOx emission standards by June 2004.	The emissions levels of NO_x and SO_2 are well within the standards proposed by CPCB.
6	Control fugitive emissions from all the raw material and products storage and transfer points by December 2003. The feasibility for the control of fugitive emissions from limestone and coal storage areas will be decided by the NTF. The NTF shall submit its recommendations within three months.	The fugitive emission are controlled by following measures : ❖ Raw meal, Clinker, Cement and dry fly ash are stored in RCC Silos with bag filters. ❖ Covered sheds are provided for Raw materials storage like crushed limestone, Imported Coal, petcoke, Lignite, Wet Fly ash and Gypsum ❖ Cement packing rotors/machines are equipped with dust extraction system with adequate ventilation. ❖ All transfer points are fully closed and fugitives controlled by water spraying or extraction to Bag filters. ❖ All raw material handling area are covered with RCC pavement and road sweeping is being carried out using sweeping machines.
7	CPCB, NCBM, BIS and oil refineries will jointly prepare the policy on use of pet coke as fuel by July 2003.	Petcoke is used as Fuel in Kiln apart from Imported coal and Lignite.
8	NTF will decide feasible unit operations/ sections for installation of continuous monitoring equipment. The industry will install the continuous monitoring systems (CMS) by December 2003.	The Continuous Emission and Effluent monitoring systems are installed and readings are connected to TNPCB CARE AIR Centre & CPCB Server through online.
9	Tripping in Kiln ESP to be minimized by July 2003.	Tripping of ESP is minimized by taking all the necessary precautions and interlocking system with fan main drive is provided.
10	Industries will submit the target date to enhance utilization of waste materials.	Installed Alternative fuel feeding system to utilize Hazardous/Non-Hazardous waste material in the Cement Kiln. Currently we are co-processing Foot wear waste, Tyre chips, Plastic waste, FRP, Solid Waste Mix and Textile ETP Sludge in Cement kiln by getting necessary authorization from TNPCB. Every year, quantity of co-processing in kiln is being intimated to TNPCB and CPCB. Co-processing emission monitoring also been carried out with NABL accredited labs half yearly.
11	NCBM will carryout a study on hazardous waste utilization in cement kiln by December 2003.	Hazardous and non-hazardous waste is being co-processed in the cement kiln.
12	Cement industry will carry out feasibility study and submit target date to CPCB for cogeneration of power by July 2003.	Entire cooler hot gas is being used to dry raw materials in vertical raw mill as well as in vertical cement mill.

2.3 Existing Cement Process

The run-off mine material from the quarries will have the size composition ranging from powders to boulders of size 1200 mm. This is dumped into the crusher pit. There are two crushers. KHD & FLS Kiln raw material crushing viz. one no.400 TPH L&T HAZE MAG impactor. A laminated conveyor carries the material and feeds it to the crusher. And one no. L&T HAZEMAG Impact crusher of 1000 TPH capacity .The feed material is crushed to a size of below 55 mm A wobbler Feeder is installed to separate the fine particles (below 45mm) from the feed material prior to the Crusher to increase the crusher output. Since the Limestone is of Clay admixed nature it carries 8-12 % moisture.

Presence of high amount of moisture eliminates the dust nuisance during handling of the same. However in the Impactors due to the high speed of Rotation considerable quantity of dusty air is displaced out. To avoid dust nuisance due to the same a high efficiency bag filter system is installed to vent out the air after filtering the dust. The filtered dust particles are recycled to the process. Fuel oil fired thermic fluid heating systems are installed for the Impactors to circulate hot thermic fluid through the upper and rear housing of the Crushers. This keeps the surface at hot condition and avoids build up of coating inside the crusher housings.

Preblending & Storage: KHD Line: The product from the crusher is conveyed through belt conveyors to the preblending section which is a circular Stacker Reclaimer, having holding capacity of about 40,000 MT. The feed to the stacker is stocked in layer by layer with the help of a boom conveyor, resulting into a Chevron type pile formation. Extraction of material is done by cutting the pile, cross sectionally with the help of a Rake car & Scraper conveyor. This process blends the material well to achieve a nearly uniform quality. The blended limestone is then conveyed through belt conveyors to the raw material grinding section and fed into the intermediate hoppers. A smaller quantity of High grade Limestone is crushed in the Crusher III and the same is transported through a separate stream of belt conveyors and stocked in the Additive hopper/Storage yard. Necessary corrective/additive materials like Alumina clay, Fine silica are also stocked in the yard separately and fed to the mill feed hoppers with the help of OverHead cranes. FLS LINE: In case of FLS Line theproduct from the crusher is conveyed to the preblending section, which is a Circular Stacker Reclaimer with a storage capacity of 50,000 MT.

There are three nos. of Coarse Correction hoppers where the crushed additive materials are stored. An online GAMMA MATRIX analyzer is installed in the crusher output belt conveyor to monitor the composition of the feed material to the Stacker continuously and necessary corrective materials are added to maintain the required raw mix quality prior to the Stacker. From the stacker the material is reclaimed and conveyed to the mill feed Limestone hoppers through a pipe conveyor. A separate Linear Stacker of 14,400 MT capacity is installed for the storage of additive materials such as Clay, Fine Silica, Ferrogenous Limestone and Sweetner (High Grade Limestone). The feed to the Stacker is stocked in layer by layer with the help of a boom conveyor resulting in a Chevron type of pile formation. Similarly separate piles are formed for each additive material. Side reclamation is done by a bridge scrapper and the material is conveyed through belt conveyors to the respective mill feed storage hoppers..

Raw Material Grinding & Homogenisation : The crushed limestone is pulverized in the Raw grinding section to facilitate a uniform quality of raw mix. At Dalmia Plant, energy efficient Vertical Roller Mills are used for drying & grinding of limestone. The blended Limestone along with other corrective/additive materials stored in separate hoppers is fed to the Vertical Roller Mill in the desired proportions. The material gets ground due to the attrition and compression action of rollers which are pressed hydraulically

over the rotating circular grinding table. Due to centrifugal action of rotating table the partly ground material is thrown out over the gas ring which is on the outer periphery of table. Utilising the heat of hot gas drawn from kiln system, which is emerging through the gas ring, the moisture in the material is driven out. The mill has an integral dynamic classifier, which helps to effectively control the fineness of the ground powder.

KHD Line: The fine powder, which is leaving along with the gas due to the suctioncreated by the mill fan, is dedusted primarily in two cyclone separators placed before the mill fan (incase of VRM II). Fine dust passing out of the cyclones is collected finally in the Bag House and the clean gas is exhausted out. The ground material, which is known as Raw meal, is then conveyed to the continuous blending and storage silo. KHD line has two no of raw grinding mills with a grinding capacity of about each190 tph & 50 tph. Continuously a small quantity of representative sample is drawn from the stream of raw meal fed to the storage silo using an automatic sampling system. This sample is analyzed in the advanced X-RAY Analyzer system for its chemical composition and necessary corrective action is taken by adjusting the Limestone, Clay and other components feed proportions to the mill. This system enables a closer control of the quality of raw mix, which in turn ensures a consistent quality of end product.

The Raw meal storage silos (2 Nos) are of Continuous storage and blending type with a holding capacity of 5,000 MT each. The silos are provided with bag filters to vent out the aeration given. Cross belt analyzer installed in the mill feed belt continuously analyses the mill feed materials and adjusts the feeding of different additives like clay to get the desired raw material quality to be fed to the kiln. This system enables a closer control of the quality of raw mix, which in turn ensures a consistent quality of end product.

FLS Line: The fine powder leaving along with the gas due to the suction created by themill fan is dedusted primarily in four nos. of cyclone separators and finally dedusted in a Reverse Air Bag house and the clean gas is vented out. The ground raw meal is stored in the Blending Silo of 15,000 MT storage capacity. Cross belt analyzer installed in the mill feed belt continuously analyses the mill feed materials and adjusts the feeding of different additives like clay to get the desired raw material quality to be fed to the kiln. This system enables a closer control of the quality of raw mix, which in turn ensures a consistent quality of end product.

Clinkerisation (Burning) : The homogenised raw meal, which is drawn from the silo, is then fed to the kiln system. Dalmia cement has two kiln streams in operation. i.e. KHD and FLS Kiln. These are modern energy efficient and highly automated dry process kiln produces about 3300 TPD for KHD and 3800 TPD for FLS. For KHD used for oil well cement clinker as well as for Ordinary Portland Cement Clinker production. And FLS Kiln used for Ordinary Portland Cement Clinker production. Stream I & II (Dry Process): a) KHD & FLS Dry Process With Precalciner System: The Raw meal powder extracted from the Storage silo is then fed to the Kiln system for burning and to convert it as Clinker. Clinkerisation is essentially a burning process where in the feed material is first heated in the Preheater system to completely drive out the moisture. Subsequent to this, the material is heated to a temperature of 880 ^{0}C with the burning of coal in the Precalciner system. The carbonates in the feed material undergo dissociation and pure oxide components are formed.

The calcined material which is then progressively heated to a temperature of about 1250 ^{0}C to 1450 ^{0}C in the Rotary Kiln by burning of fuel in Kiln firing system. At this high temperature the material reaches to a semi molten stage and the SiO_2, Al_2O_3, Fe_2O_3 present in the rawmix combines with CaO in raw mix and

forms the various complex chemical compounds. The material after firing gets converted to a grey mass, which is known as Clinker. The hot clinker is then cooled using the ambient air given into the Grate Cooler system. The cooled clinker is then taken to the clinker storage. The Kiln exhaust gas, which is at 350 to 370 ^{0}C (in the case of KHD) and 290 Ð310 ^{0}C (in the case of FLS), is utilized for Raw material and Coal drying & grinding in the Raw mill and Coal mill respectively. In case of KHD Line there is a Bag House installed common to Raw mill and Kiln to dedust the kiln gas. When the Raw mill is in operation the Kiln exhaust gas passes through the mill and gets dedusted in the twin cyclones & Bag House. When the mill is not in operation the Exhaust gases will be passed through the Gas conditioning tower where the gases are cooled by spraying water.

In case of FLS Line a Reverse Air Bag house is installed in common to Raw mill and Kiln to dedust the kiln gas. When the raw mill is in operation the kiln exhaust gas passes through the mill and gets dedusted in the four cyclones & RABH. when the mill is not in operation the exhaust gases is diluted with the atmospheric air to reduce the temperature of the gas and is then dedusted in the RABH. Hot ESPs are provided in the cooler sections to dedust the fine clinker particles in the cooler exhaust air. In the clinker handling circuit to avoid dust nuisance bag filters are provided. b) Solid Fuel storage, handling, Drying and Grinding: For KHD Line: Solid fuels like Coal & Lignite are received in trucks and wagons and stored in separate bays at the open gantry yard. Small quantity of Plastic wastes and other industrial solid waste fuels are also stored separately in the yard. Fire hydrant water lines are provided at the complete coal handling section as a precaution against fire risk due to self-ignition of Coal/Lignite. Raw Water / Waste Water from the process is sprayed over the coal to minimize the fugitive emission.

From the storage yard the material is fed to the hopper at the storage yard with the help of the legged crane and Crushed to below 25 mm size at the triple roll crusher and fed to the mill feed hoppers. In desired proportions the material is extracted from the hopper and fed to the Coal mill where a portion of the hot gas drawn from the kiln system is utilized for drying of the material and ground in the ball mill system. The fine ground particles are collected in the high efficiency bag filter system. The fine coal is stored in the storage bins and fed to the firing as required. For FLS Line: The coal and lignite received by trucks are dumped into a hopper and conveyed to the Coal Linear Stacker of 25,500 MT storage capacity. Then the coal is reclaimed and conveyed to the coal hoppers through a pipe conveyor. From the hoppers the desired proportions of the materials are extracted and fed to the Coal Vertical Roller Mill where the coal is ground to the desired fineness. A part of the preheater exhaust gas is used for drying and conveying. The ground coal is separated from the gas stream in a high efficiency bag filter system. The fine Coal is stored in three nos. of storage bins and fed to the firing in Kiln, Precalciner and Hot Air Generators.

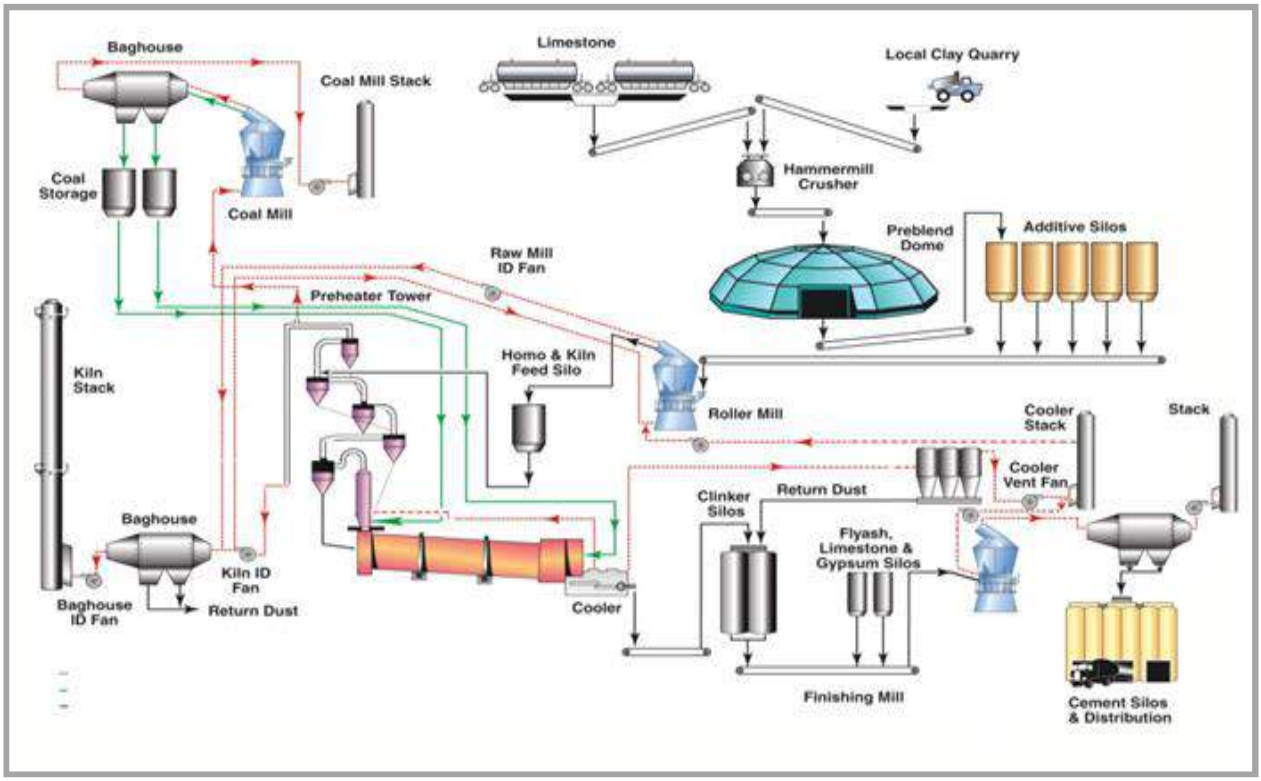
Cement Grinding : At Dalmia cement both ball mill grinding systems and latest state of the art vertical roller mills are available for cement grinding. While grinding of cement clinker, a small proportion of Gypsum is also added. This is essential for introducing a delay in setting time, to allow sufficient time for construction, without actually loosing the strength of cement. Depending on the type and properties of cement required, other additive materials such as Pozzolanic Fly ash, Blast furnace slag are added to the clinker and ground. Fly ash received from the power plants and Gypsum received are stored in a separate stocks as well as covered storage facility. A dedicated conveyor stream feeds the said materials to the Cement mill. In case of FLS line there is a separate storage silo of 7,000 MT storage capacity for Dry Flyash wherein the flyash received from power plants are pumped directly to the silo and extracted for feeding to mill. A linear stacker of 24,400 MT storage capacity is installed for the storage of wet flyash and gypsum from where they are reclaimed and fed to the mill feed hoppers through a pipe conveyor.

The product cement from the mill is continuously monitored for its quality and composition. The finely ground cement is then taken to the silo for storage. Bulk of the cement grinding is done in the energy efficient vertical roller mill system.

Cement Packing & Despatch : To handle the multiple variety of cement produced, there are 14 nos. of storage silos for KHD line and 4 nos. of silos for FLS line available at Dalmia cement. There are six packing machines (Five Rotary and one Stationary type) with a total packing capacity of over 1,140 TPH is available to pack the cement in packs of 50 kg bags. The state of the art Rotary electronic packing machines have higher packing rates, at the same time ensures that every bag of cement leaving the packing machine has 50 kg weight. Facilities are also available to pack the cement in bulk capacities of say 1,000 kg bags for the benefit of bulk users. All the packing machines are provided with High efficiency bag filter systems to take care of fugitive dust emissions during handling and filling of cement in bags. The packed cement is then despatched to the various customers spread all over Tamil Nadu, Kerala & Pondichery through lorries and rail. Facilities are also available to despatch cement directly through tankers for the benefit of ready mix concrete makers and other users.

The Cement Manufacturing General Process Flow Chart is given as **Plate V**. Raw Material Source and their mode of Transportation is given in **Table 2.7**.

Plate : V Process Flow Chart



The MOU/Trade Confirmation for the supply of Petcoke is attached as **Doc-10**.

Table : 2.7 Raw Materials, Source and Mode of Transportation - Existing

Sl. No.	Raw Material	Source	Max. Demand, TPD	Mode of Transportation
1	Limestone	Captive Limestone mines in Trichy & Ariyalur District	11300	From crusher by closed conveyors to plant
2	Fire Clay	Local Market	255	Covered 20 Ton truck by road
3	Lignite/ Petcoke/ Coal	Neyveli Lignite Corporation (NLC)/ Imported/ Local Coal Mines	2000/ 1250 1600	Covered 20 Ton truck by road (50% 50% by Rail
4	Synthetic and Chemical Gypsum	IL&FS & Greenstar Fertilizers, Thoothukudi	410	Covered 20 Ton truck by road
5	Fly ash	NLC, IL&FS, North Chennai Thermal Power Station	4255	20/40 Tons Bowsers
6	Slag	Jindal Steel Plant, Salme	300	Covered 20 Ton truck by road
7	CPP : Lignite	NLC	762	Covered 20 Ton trucks by road
8	CPP : Coal	Local Coal Mines or Imports from USA/ SA/ Indonesia	590	Covered 20 Ton trucks by road

2.4 Captive Power Plant

In the conventional steam system operating on Rankine Cycle, the main equipments are the steam generator, steam turbine and the condenser with their auxiliaries. The utilities system includes fuel-handling, water to plant for cooling circuit and lub oil, firewater, compressed air systems etc. The basic of power cycle configuration chosen for CPP is with the following tap off regeneration:

- One high pressure;
- One low pressure; and
- On de-aeration.

Steam Generator : The steam generator will consist of one Atmospheric Fluidized Bed Combustion (AFBC) type coal/lignite fired boiler with all auxiliaries. The boiler shall have natural circulation, balanced draft and membrane wall radiant furnace design with two stage super- heaters and inter-stage de-super heater.

Steam Drum : The steam generator shall be provided with a fusion welded type steam drum and shall have the necessary nozzle connections for the steam outlets, safety valves, feed water inlets, down-comers, continuous blow down, level indicators, chemical dosing, sampling connection, drains and vents to assure the required steam purity.

Furnace : The furnace envelope shall be made of fully water-cooled membrane/fin welded walls and the construction shall be gas pressure tight. The furnace bottom shall be covered with an air nozzle tube plate, below which the fluidizer air plenum shall be located. The coal/lignite of properly graded size shall be brought to the fluidizer space by pneumatic transportation under bed feeding system.

Super Heater : Super heater system shall be of two stage design with inter stage de superheating to achieve the rated steam temperature over 60% to 100% MCR load. The super heater shall be combination of convection type and radiation type. The inter-stage attemperator or a de super heater of spray type shall be located between the two super heater stages to control the final steam temperature between 60% to 100% MCR load.

Economizer : The economizer shall be located downstream of the super heaters and evaporated sections. The economizer shall be of bare tube construction, inline arrangement, counter flow type and shall be designed for inlet temperature of 200 ^{o}C.

Air Heater : Air heater shall be arranged as the last heat recovery section downstream of economizer.
Air heater shall be recuperative type with flue gas flowing inside the tubes and the combustion air flowing over the tubes.

Draft System : The draft system for the steam generator shall be suitable for producing a balanced draft with sub-atmospheric pressure condition in the furnace. The system shall comprise of two FD fan (50%), two ID fan (50%) and two PA fan (100%).

HP and LP Dosing System : Steam generator shall be provided with Low Pressure (LP) and High Pressure (HP) dosing system. During HP dosing, tri-sodium phosphate shall be dosed in boiler water to take care of the ingress of the hardness salts and to increase the boiler water pH. While during LP

dosing, hydrazine shall be dosed in the feed water to scavenge the last trace of oxygen and to increase the feed water pH.

Blow Down Tank : One Continuous Blow Down (CBD) tank and one Intermittent Blow Down (IBD) tank shall be provided for the boiler. The flash steam from the CBD tank shall be piped to the de-aerator and outlet of the IBD tank shall be vented to the atmosphere.

De-aerator : One De-aerator of de-aerating capacity equal to 20% higher than the gross MCR steam generation capacity of the boiler with de-aerated water storage of minimum 20 minutes operation shall be provided.

Boiler Feed Water Pump : One working and one standby boiled feed water pumps along with constant speed drive motors have been envisaged.

Steam Turbine : One 23MW triple extraction-cum-condensing turbo-generator is envisaged. It is proposed to install air-cooled condenser for the turbine in place of water-cooled condenser to reduce water requirement drastically. With an air cooled condenser, the lowest possible heat sink temperature will be ambient air dry bulb temperature as against wet bulb temperature in case of the water cooled condenser. Consequent to this turbine exhaust pressure will be around 0.2 D0.25 kg/cm2 for air-cooled condenser as compared to about 0.1 kg/cm2 in case of water-cooled condenser. This mainly results into increased specific steam consumption of the turbine in air-cooled condenser.

The turbine shall be horizontal, single cylinder, triple extraction-cum-condensing type. All casings and stator blade carriers shall be horizontally split. The controlled steam from the turbine shall be delivered to the heaters/de-aerators in saturated condition. A de-super heater to bring the steam temperature from the extraction steam temperature down to the required level is envisaged.

Lubrication System : A pressure lubrication and control oil system shall be provided for the turbo-generator unit to supply oil at the required pressure to the steam turbine, gearbox, generator and governing system.

Turbine Governor : The turbine governing system shall be electro-hydraulic type, designed for high accuracy, speed and sensitivity for response. The governor shall ensure controlled acceleration of the turbo generator and shall prevent overDspeed without tripping the unit under any operating condition or in the even of maximum load rejection. The governing system shall have the following important functions: Speed control; Over speed control; Load control; and Steam pressure control.

Air Cooled Condenser : The capacity of the air-cooled condenser shall be designed to condense steam at 0.2 to 0.25 kg/cm2 with a normal atmosphere air inlet temperature of 40 0C. The air-cooled condenser shall have number of modules with each module having tube bundles. The tubes shall be finned type either of aluminum or carbon steel material (galvanized).

Steam from the exhaust of the turbine shall be equally distributed to all tube bundles from the top by the steam header and the condensate shall be collected at the bottom through a condensate header and discharged to condenser hot well. Forced draft fans (axial type) of multiblade construction shall be used to supply air for cooling. Two steam ejectors (100%) are used for air evacuation and maintenance of vacuum in the air- cooled condenser. Two condensate extraction (100%) pumps for each hot well of the

air-cooled condenser to the deaerator through LP heater shall be provided.

Turbine Control : The turbine control shall be through the centrally located Distributed Control System. The control system shall provide redundancy for key functions by use of separate sensors and monitors. The control system shall include all the standard control monitoring and alarming.

In addition to centralized monitoring, some of the essential parameter mounted in local shall be: Inlet steam pressure and temperature; Uncontrolled extraction steam pressure and temperature; Controlled extraction steam pressure and temperature; Exhaust steam pressure and temperature; Lube oil header pressure; Control oil header pressure; Steam turbine/generator speed indicator; Steam turbine/generator stop push button; Run light; and Emergency shutdown push button.

Fuel : 100% coal or 100% lignite and/or any combination of two shall be used as fuel for the proposed CPP.

Coal/ Lignite Receipt and Storage : The requirement of fuel is estimated to be 590 TPD Coal or 762 TPD Lignite.

Coal/Lignite is received by trucks and unloaded in existing dump hopper. From the dump hopper, the material is stacked in the existing coal stacker.

Coal/Lignite Crushing and Storage : From the reclaimer belt conveyor, coal/lignite shall be fed to the crusher building. A vibrating screen shall be provided before the crusher to screen out coal/lignite sizes up to 6 mm and course particles shall be fed to the roll crusher. The 6 mm material shall be conveyed with the help of a belt conveyor to the coal/lignite bunker near the boiler. The bunker shall have a capacity of requirement of 24 hours i.e. three shifts for boiler.

Ash Handling System : The total ash produced from CPP would be about 95 TPD. Fly ash is transported pneumatically with the help of dense phase pneumatic pumps to the cement mills and is fully used in manufacturing of Portland Pozzolana Cement. Bed ash is collected from overflow spouts into ash cooler hoppers. Ash from hoppers, after sufficient cooling is discharged to a belt conveyor and is used as additives to cement raw mix.

Captive Power generation is 50 MW. ESP and a stack of 80 m height are provided to control PM emission **<50 mg/Nm^3**.

Trade effluents viz. Boiler Blowdowns, Cooling Tower Blowdowns and RO/DM Plant Rejects generated in the CPPs are treated in a **500 KLD Effluent Treatment Plant (ETP) with Tertiary Treatment System and used for Industrial Cooling of Cement Plant Machineries**.

2.5 Cement Plant Machineries & Storage Facilities

The existing Cement Plant Machineries, Storage Facilities, etc. are given in **Tables 2.8 & 2.9**.

Table : 2.8 Existing Machineries

Equipment	Operating capacity
Crusher	95 0 TPH FOR FLS, 800 TPH FOR KHD 650 - TPH - FOR LINEAR STACKER
VRM II	215 TPH
VRM III	340 TPH
KHD Coal Ball Mill	24 TPH
FLS Coal VRM	36 TPH
KHD Kiln	3,500 TPD
FLS Kiln	4,300 TPD.
CVRM I	180 TPH
CVRM II	305 TPH
BALL MILL-2	25 TPH
BALL MILL-3	62 TPH
Roto I	120 TPH
Roto II	180 TPH
Roto III	240 TPH
Roto IV	240 TPH
Roto V	240 TPH
HAVER & BOCKER	45 TPH
KHD BULKER LOADING	62 TPH
FLS BULKER LOADING	220 TPH

Table : 2.9 Existing Storage Facilities

Description	Capacity, MT
Clinker Silo	60000
Off-Spec Silo	800
Circular Stacker	50000
Corrective/Additives Linear Stacker	14400
Additive Linear Stacker	26400
Raw Meal Silo	15000
Dry Fly Ash Silo	5000
Cement Silo (4 Nos)	31000
Coal Linear Stacker	25500
Cement Silo	8000
Clinker Silo	60000
Raw Meal Silo	10000
Circular Stacker	40000
Silo-1	1500
Silo-2	1500
Silo-3	1250
Silo-4	1500

Description	Capacity, MT
Silo-5	1500
Silo-6	1500
Silo-7	1500
Silo-8	1250
Silo-9	1500
Silo-10	1500
Silo-11	1250
Silo-12	1500
Silo-13	1500
Coal Yard	35000
Fly Ash Shed	2500
Gypsum Shed	2000
Crane Hall Clinker Storage For Polysius	20,000
Dd Silo/ Dry Fly Ash Storage	1,200

2.6 Power Demand

The Power demand is as follows :

Connected load	:	71050 KW
Operating load	:	36000 KW
TANGEDCO Grid max. demand	:	5500 KVA
CPPs Operating Capacity	:	45 MW

Gensets (2x2 MW and 2x4 MW) are in standby which are being operated on heavy fuel oil (LSHS/Furnace oil and Diesel is used as startup fuel).

In addition to the above, Renewable Power sources in the form of wind power generated in DCBL Wind Farm (16.525 MW installed capacity) at Muppandal (about 375 km from plant site).

2.7 Fuel Demand

The Cement Plant will be utilizing Furnace Oil for Kilns initial firing. Petcoke is used as fuel in the Kiln. Also, Coal and Lignite are used as fuel for both Cement & Power Plants. HSD is used as fuel for Standby DG sets. The quantity and storage details are appended :

Furnace Oil	:	500 KL + 46 KL + 52 KL
SKO	:	20 KL
HSD	:	54 KL
Sludge Oil	:	12 KL

2.8 Existing EMP Measures

Air Pollution Control Measures : The Cement Plant is being operated for **PM emission <30 mg/Nm^3**. **Online Stack Monitoring Systems** are provided to all main Stacks viz. Kiln/Raw Mill, Coal Mill, Cooler and Cement Mill in the Cement Plant & Boiler Stacks in CPP to monitor PM & gaseous emissions (SO_2 and NO_X) at Kiln/Raw Mill & CPP Boiler Stacks and the **real time emission data are being transmitted to CARE Air Centre of TNPCB & CPCB**. Necessary **interlocking facilities are provided** in the pollution control equipments. **Two numbers Continuous Ambient Air Quality Monitoring Station**s (CAAQMS) are installed at the Plant in Upwind & Downwind directions for PM2.5, PM10, SOx & NOx and the data are being transmitted to CPCB and CARE Air Centre of TNPCB.

Water Demand : The total water requirement for the Cement Plants, Captive Power Plants and Colony is **2567 KLD** (average) and the fresh water demand is only 2,225 KLD..

Unit : KLD

Cement Plant-Process absorption	:	205
Cement Plant-Equipment Cooling	:	593
Domestic Use	:	117
DM & RO Plant requirements	:	756
Dust Control Measures	:	139
Green Belt makeup water	:	87
Township	:	450
Green Belt-Township	:	70
For Public Supply	:	150

Total	:	2567
Treated Water recycling to the Plant	:	342
(in addition to 165 KLD for Green Belt)		---
Actual Fresh Water Demand	**:**	**2225**

This requirement of water is presently drawn from **Coleroon River** through the existing water supply system to the plant. DCBL has already **obtained permission for a withdrawal quantity of 3200 m^3/day of water from Water Resource Organization, Cauvery Basin Circle, Tiruchirapalli in 1988** vide renewed GO No. 201 dated 22.09.2014.

Wastewaters Generation Treatment & Disposal : The Cement Plant, CPPs and Township generate about 352 KLD Domestic Sewage. The Domestic Sewage from the Plants are collected in about 21 Septic Tanks (Collection Tanks) and the overflow is transported and treated in a Combined 500 KLD Sewage Treatment Plant (STP) in the Colony and the Treated Sewage of 342 KLD is fully utilized for Green Belt Development and Dust Control Measures.

The Cement Plant (277 KLD) & CPP (230 KLD) generate about 507 KLD trade effluents as Boiler and Cooling Tower Blowdowns and RO/DM Plants Rejects. The total **507 KLD effluents from CPP** are treated in a 500 KLD ETP, in Batch Process @ 255 KLD/Shift in 2 Shifts, and the Treated Effluent is pumped to the Cement Plant for Cooling of Cement Plant Machineries and Dust Control Measures. Thus, **"Zero Effluent Discharge"** is practiced at the Complex.

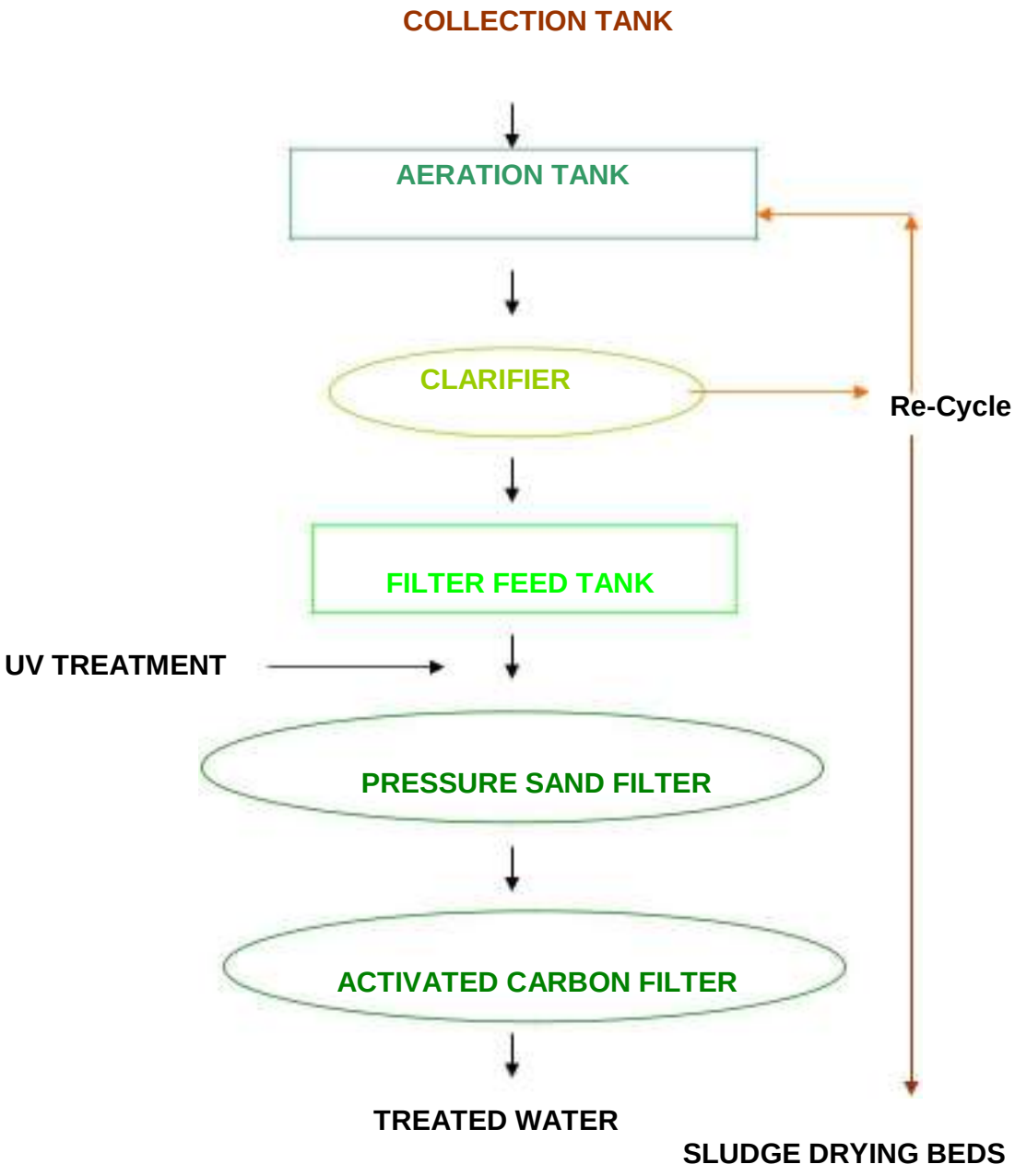
Table : 2.10 Septic (Collection) Tanks Dimensions

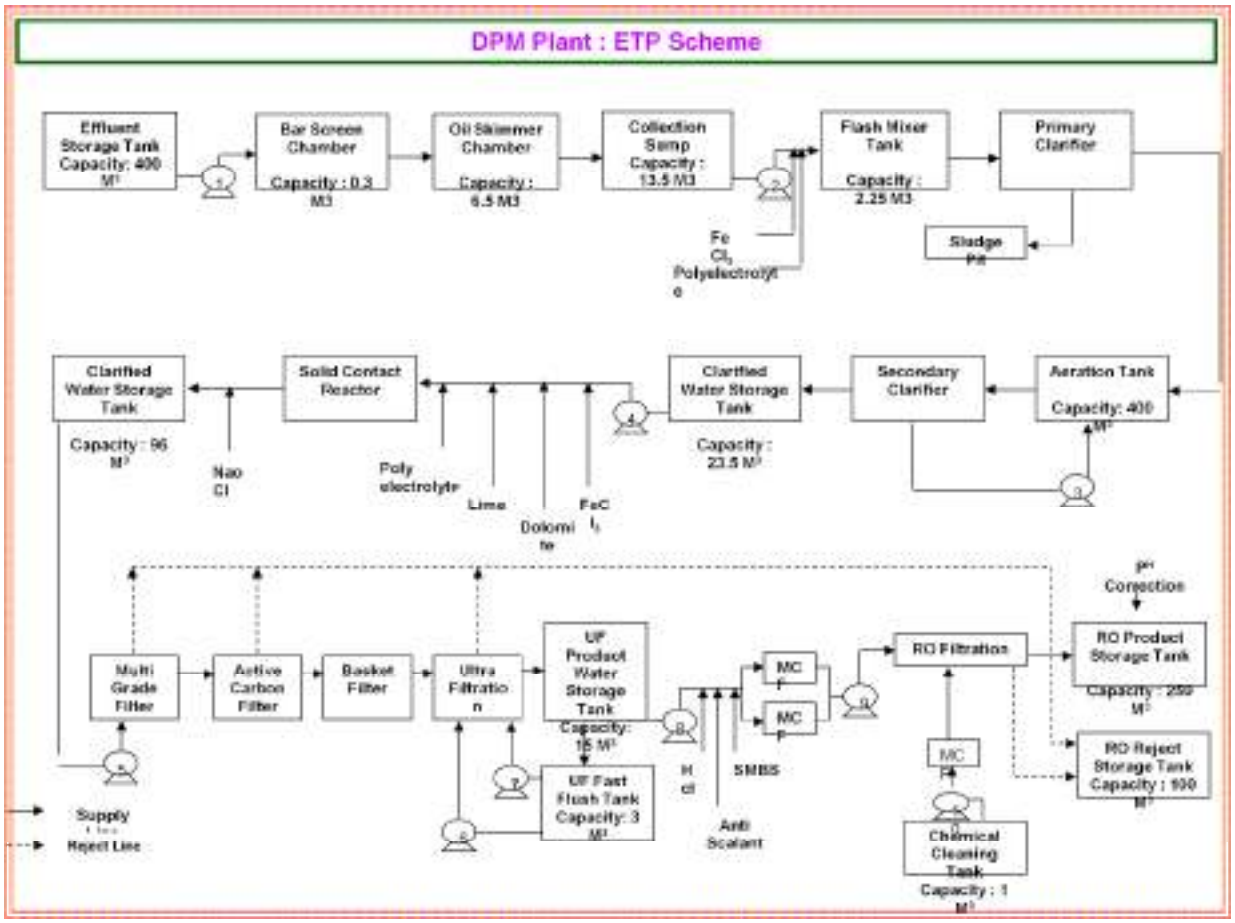
Sl. No.	Location	Nos.	Length (m)	Breath (m)	Depth (m)	Capacity (Cu.m)
1	New Civil Office area	1	5.4	2.44	1.5	19.8
2	Safety Office area	1	6	2.9	2.4	41.8
3	Old Civil Office area	1	2.65	2.2	2.4	14.0
4	Roto 1 toilet area	1	3.1	2.1	1.0	6.5
5	Roto 2 toilet area	1	6.8	2.5	1.7	28.9
6	KHD ccr area	1	4.7	2.7	3.2	40.6
7	KHD general toilet area	1	4.5	1.9	2.3	19.7
8	KHD ladies toilet area	1	3.5	1.6	2.1	11.8
9	Work shop & Diesel loco area	1	6	1.9	1.5	17.1
10	Diesel loco back side area	1	2.45	1.5	2.0	7.4
11	CVRM 1 area	1	4.3	2.3	1.9	18.8
12	CVRM 2 area	1	4.5	2.5	3.0	33.8
13	Line 2 Packing Plant area	1	4.5	2.4	2.4	25.9
14	LC 1 Back side area	1	3.7	1.5	2.5	13.9
15	FLS ccr area	1	4.3	3.1	2.7	36.0
16	FLS Mech. Site area	1	3.5	3.5	3.2	39.2
17	FLS Limestone Stacker area	1	4.5	2.5	2.6	29.3
18	Cement weigh bridge area	1	3.5	2.5	1.9	16.6
19	Crusher 4 area	1	3.2	2.2	1.5	10.6
20	Clar Office area	1	3.7	1.4	2.8	14.5
21	CCP area	1	5.5	2.7	2.1	31.2

The 500 KLD Sewage Treatment Plant is based on the following Parameters

Nature of Wastewater	Domestic sewage
Designed capacity	**500 KLD**
Hours of Operation	20 Hours
Flow cum /hr	25.0 m3/hr
Suggested Treatment System	**Activated Sludge Process followed with filtration cum adsorption.**

Sewage Treatment Plant Flow Chart





The **latest TNPCB Survey Reports** of the Cement Plant are appended.

TAMILNADU POLLUTION CONTROL BOARD
Adavanced Environmental Laboratory,Trichy.

From
Shankara Subramanian.M.Sc.
Chief Scientific Officer (Lab),
Advanced Environmental Laboratory,
Tamil Nadu Pollution Control Board,
25,Developed Plot,SIDCO,
Thuvakudi, Trichippalli-620 015.

To
M/s.DALMIA CEMENT(BHARAT) LTD.
(Cement Plant),
Palinganatham Village,
Ariyalur Taluk,
Ariyalur Dt,
Pin Code-621 651.

Lr.No.**TNPCB/AEL/TRY/AIR/** **45** /AAQS/SM/2018-19. Dated: 30/07/2018.

Sir,

Sub:
Furnishing of Report of Analysis of Ambient Air Quality/Stack Monitoring / Ambient Noise Level Survey-regarding.

Ref: 1. T.O.Lr.No 36/2018-19 Dated: 08/05/2018
2. Yr ltr. No.Nil Dated:
3. Cash Receipt No.**39568** Dated: 25/07/2018
Rs. 90,200

****

The Report of Analysis of Ambient Air Quality /Stack Monitoring/Ambient Noise Level Survey conducted in the vicinity of your Industry on **17&18/07/18.** along with the Bill for Rs. **90200** **(Rupees Ninety Thousand Two Hundred only)** is furnished herewith.

Kindly acknowledge the receipt of the above without fail

30/7/18

Chief Scientific Officer(Lab)
AEL-Trichy

Encl: As above
Copy Submitted:

1. The Joint Chief Environmental Engineer (M) Trichy.
2. The Deputy Director (Lab) TNPCB, Chennai.
3. The District Environmental Engineer, Ariyular (Dt).
4. To File.

Report 45 /SM/2018-19 Dated: 30/07/2018.

1. Name of the Industry : **M/s.DALMIA CEMENT(BHARAT) LTD.**
2. Address of the Industry : (Cement Plant), Palinganatham Village, Ariyalur Taluk,
3. Date of survey : 17&18/07/18.
4. Consent Order No. : **170828503144**
5. Classification : Red Large

Stack Analysis Report

Sl. No	Stack attached to	Stack Temp °C	Velocity in (M/sec)	Discharge rate in (Nm^3/hr)	Pollutants (mg/Nm^3)				
					PM	SO_2	Nox	CO PPM	O2 %
1	Klin-Raw Mill, **Line-I** (KHD) (Vertical Rolling Mill)-3000TPD, Fuel-Coke,Coal,alternate Fuel, APC-ESP.	122	13.4	352051,5	22,6	68.6	145.5	121.0	18.
2	Dust Collector-Coal Mill-25 TPH(Ball Mill)-KHD,**Line-I,** APC-Bag Filter.	75	14.6	203842.9	25.0	----	----	---	---
3	Dust Collector-Cement Mill (Vertical Roller Mill) **Line-I,150TPH,**APC-Bag Filter.	81	12.3	482343.0	21.4	----	----	---	---
4	Fume Exhaust-Cooler Vent-KHD,**Line-I**,3300-TPD, APC-ESP	253	16.9	337193.9	27.1	----	----	---	---
5	Klin-Raw Mill, **Line-II** (FLS) (Vertical Rolling Mill)-3000TPD, Fuel-Coke,Coal,alternate Fuel, APC-Bag Filter.	116	13.8	554033.7	23.3	65.5	155.7	113.0	18,8
6	Dust Collector,**Line-II,** Coal Mill,(Vertical Rolling Mill), 35-TPH,APC-Bag Filter.	81	15.0	368837.0	22.6	----	----	----	----
7	Dust Collector,**Line-II,** Cement Mill,(Vertical Rolling Mill),350TPH,APC-Bag Filter.	87	12.8	555282.7	19,6	----	----	----	----
8	Fume Exhaust-Cooler Vent, **Line-II**,4000TPD, APC-ESP.	244	17.3	464525.7	25.4	----	----	----	----

Chief Scientific Officer(Lab)
AEL--Trichy

Ambient Air Quality Survey Report

Report No. **45** /AAQS/2018-19 Dated: 30/07/2018

1. Name of the Industry : **M/s.DALMIA CEMENT(BHARAT) LTD.**
2. Address of the Industry : (Cement Plant), Palinganatham Village, Ariyalur Taluk,
3. Date of survey : 17&18/07/18.
4. Duration of Survey : Eight hours
5. Category : Seventeen Category.
6. Classification : Red Large
7. Consent Order No. : **170828503144**
8. Time of survey started in Hrs : 6.30
9. Time of survey closed in Hrs : 14.50

Ambient Temperature (^{0}C)	Min	Max	Relative Humidity (%)	Min	Max
	27.0	36.0		44	76
Weather Condition	Clear Sky		Rain Fall (mm)	Nil	
Predominent Wind Condition	SW-NE		Mean Wind Speed (Km/hr)	9.58	

Ambient Air Quality Survey Report of Analysis

Sl. No	Location	Direction *	Distance (m)	Height from GL (m)	Pollutants Concentrations (µg/m^3)			
					$PM_{2.5}$	PM_{10}	SO_2	NO_2
1	On top of scaffolding near Higher secondary school playground.	NNE	650	2.0	---	84	9.6	11.8
2	On top of scaffolding near Estate Office.	NE	800	2.0	43	92	16.3	20.5
3	On top of scaffolding near Executive Guest house.	SE	550	2.0	---	81	10.8	12.6
4	On top of scaffolding near Mine Office at KVK area.	SW	600	2.0	30	86	10.1	12.5
5	On top of scaffolding near Lorry parking Petrol Bunk.	WNW	700	2.0	---	82	14.4	18.5
6	On top of scaffolding at Farm house office.	NW	800	2.0	---	76	8.8	10.5

Chief Scientific Officer(Lab)
AEL- Trichy.

TAMILNADU POLLUTION CONTROL BOARD
Advanced Environmental Laboratory, Trichy.

Ambient Noise Level Survey-Report of Analysis

Report No. 45 /NSL/2018-19 Dated: 30/07/2018.

1	Name of the Industry	**M/s.DALMIA CEMENT(BHARAT)**
2	Address of the Industry	(Cement Plant), Palinganatham Village, Ariyalur Taluk,
3	Date of survey	17/07/2018.
4	Classification & Consent Order No.	Red Large **170828503144**
5	Land Use Classification	Industrial

Type of survey	Ambient	Time Of Survey	Day
Meteorological Conditions		Calm	

Logging Parameters

Instrument Used	Quest	Serial No.	CC8110035
Logging Interval	10 Minutes in each point	Measuring Range	50-110 dB(A)
Weighting	"A"	Time Weighting	Fast
Sound Incidence	Random	Time of survey in	16.00-18.00

Location	Duration (m)	Distance (m)	Direction	Sound Level –dB(A)		
				L_{eq}	L_{Min}	L_{Max}
Near compound wall of Dalmia Higher secondary School.	10	700	NNE	53.3	50.1	72.4
Near colony Estate office.	10	800	NE	52.6	49.7	69.8
Near compound wall of Guest house.	10	600	SE	51.9	49.3	67.4
Near Mine office of KVK	10	600	SW	50.3	48.4	66.3
Near compound wall of Farm house office.	10	800	NW	49.2	47.1	59.4

Chief Scientific Officer(Lab)
AEL-- Trichy.

Solid Wastes : STP Sludge of 5 Tons/Month (TPM) is vermi composted and used as manure for the Green Belt. ETP Sludge of 0.25 TPM is stored and disposed for secured Landfill. Spent Oil (Category 5.1) of 18 KL/Annum is stored and sold to the Authorised Recyclers for further recycling.

From CPP, Fly Ash @ 95 TPD is pneumatically transported to the Cement Plant and utilized for PPC manufacturing.

Green Belt : An extensive Green Belt has been developed inside & outside the Plant in a total extent of **45.72 Ha with about 33,404 Trees @ 730 Trees/Ha** with a Survival Rate in the range **85-95%** (**Plate VI**).

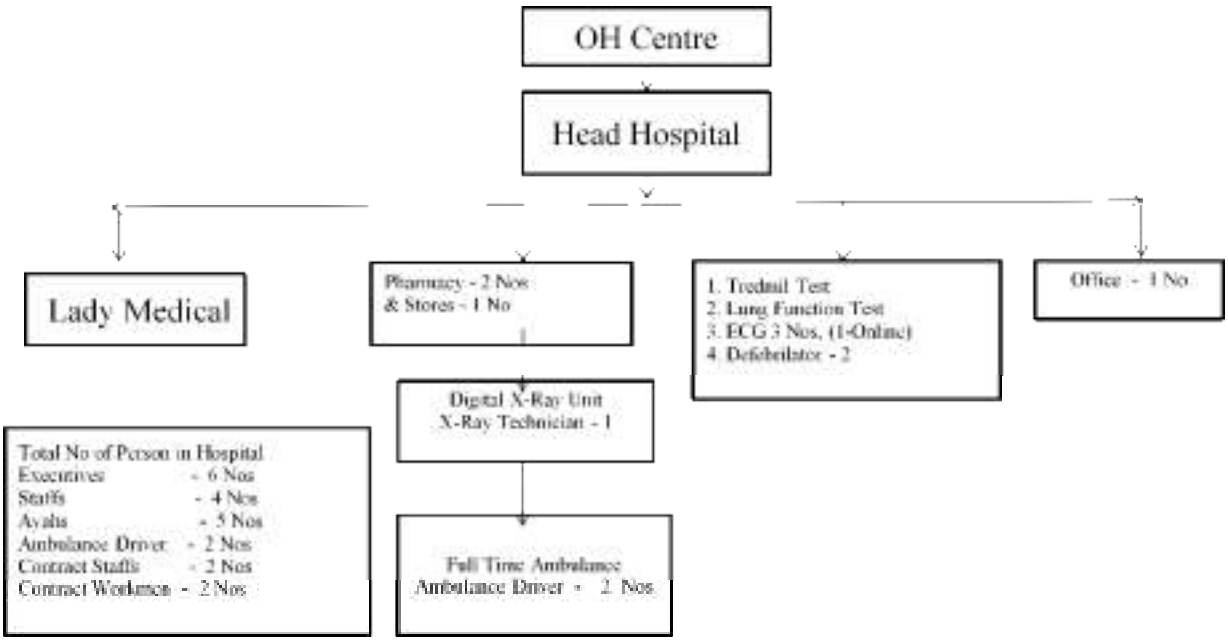
Table : 2.11 Green Belt

Description	No. of Trees Planted
Upto Mar. 2014	7,051
2014-15	4,041
2015-16	8,025
2016-17	9,850
2017-18	2,605
2018-19	1,832
Total	**33,404**

Plate : VI Green Belt

"Dalmiapuram Cement Plant has bagged the prestigious "Tamil Nadu Chief Minister Green Award for the Year 2016" from the Hon'ble Chief Minister of Tamil Nadu on 11.10.2017.

Occupational Health : A well established Hospital has been established at Dalmiapuram as detailed below :



2.9 Existing Project Cost

The existing Project Cost and EMB Budgets are given in **Table 2.8**.

Table : 2.8 Project Cost & EMP Budget

Sl. No.	Component	Cement Plant	CPPs	Total
1	Project Cost, Rs. Crores	1134.96	186.55	**1321.51**
2	EMP Capital Cost, Rs. Crores	16.25	7.80	**24.05**
3	EMP Operating Cost, Rs. Crores/Annum	1.50	0.75	**2.25**

3.0 Project Description

3.1 Need for the Proposal

As the old Line-I (KHD Kiln) and decade old Line-II (FLS Kiln) need modernisation with State-of-Art Technology, DCBL proposes the improvement of the existing Pyro Processing Systems, modernization of the machineries and also Pollution Control Measures upgradation to achieve **PM emission <30 mg/Nm^3** and other Pollutant Levels within the stipulated Norms. The Project Cost will be **Rs.76.11 Crores**.

3.2 The Proposal

Due to the Modernisation and Upgradation measures, the **Clinker Production** will be increased from exiting **2.410 MTPA to 3.230 MTPA** and accordingly, the **Cement Production** will also be increased from existing **4.020 MTPA to 5.814 MTPA** (**Tables 3.1-3.2**). The proposed Modifications and Upgardations are listed in **Table 3.3**.

Table : 3.1 Existing & Proposed Production - Linewise

Production of	Source	Unit	Existing	Proposed Addition on Modernisation	Total
Clinker	Line I	MTPA	1.090	0.320	**3.230**
	Line II	MTPA	1.320	0.500	
Cement	Line I	MTPA	1.820	0.794	**5.814**
	Line II	MTPA	2.200	1.000	

Table : 3.2 Existing & Proposed Production - Cumulative

Production of Lines I & II	Existing EC Qty. (& Consent Qty.)	Addition on Expansion	Cumulative	Percentage Increase
Clinker	2.410 MTPA (2.304 MTPA)	0.820 MTPA (with Modernisation and Upgradations)	3.230 MTPA	34.02%
Cement	4.020 MTPA (3.40 MTPA)	1.794 MTPA	5.814 MTPA	44.63%
CPPs I & II	1x27 MW 1x23 MW	-	50 MW	-

Table : 3.3 Proposed Modifications & Upgradations

Sl. No.	Proposed Modifications & Upgradations	Cost Involved, Rs. Lakhs
I	**Line-I Modifications & Upgradations**	
1	Replacement of Kiln inlet and outlet graphite seal with ITECA seal	70
2	Up gradation of Coal ball mill classifier to grind Petcoke in Ball mill. Petcoke grinding in coal mill increased from 7 - 8 TPH to 12 TPH	24
3	Replacement of Kiln coal conveying blower with high speed turbo blower to optimize power and conveying air volume	88
4	Installation of Coriolis coal dosing system for stable firing and flow and measurement accuracy system which result in stable operation of Kiln	52
5	Replacement of Kiln Duo flex burner with latest generation Pyrojet burner from M/S KHD, thereby better flame control achieved	109
6	Integration of Line-I Central Control Room with Line-II	82
7	Filter bag replacement in our CVRM-1 with new specification	28
8	Purchase of new AFR shredding machine of capacity of 5 TPH	60
9	Cooler ESP upgradation	396
10	Up-gradation of Preheater fan	500
11	Up-gradation of Cooler	2000
12	UP-gradation of Kiln main drive & Kiln feed bucket Elevator	200
13	Classifier for CVRM-1	22
14	Roller press with Ball mill	200
II	**Line-II Modifications & Upgradations**	
1	Replacement of Kiln inlet and outlet graphite seal with ITECA seal	30
2	Replacement of Kiln and PC coal firing PD blower with high speed turbo blower	99

Sl. No.	Proposed Modifications & Upgradations	Cost Involved, Rs. Lakhs
3	Coriolis coal dosing system introduction for consistent fuel firing and for measurement accuracy which also reduces SHC due to stable operation of kiln	90
4	Removal of Preheater fan inlet damper to avoid Pressure drop and increase the preheater fan flow	-
5	Installation of Online bulk loading arrangement for OPC cement loading	25
6	Replacement of Duoflex burner with PYROJET burner from M/S KHD. with the investment of Rs. 1.03 Crores (Clinker production increased due to high momentum burner)	103
7	Filter Bag replacement in CVRM-2 with new specification bags	43
8	Filter Bag replacement in Line-2 Kiln/VRM-3 RABH with new specification bags	360
9	Up-gradation of Preheater & RABH fan	800
10	Up-gradation of Cooler	2100
11	UP-gradation of Kiln main drive & Kiln feed bucket Elevator	100
12	Classifier for CVRM-2	30
	Total	**7611**

Other Modifications/Upgradations :

With other internal operational optimization viz., reduction of Fine coal residue below 2% on 90 µm, optimizing the raw mix and reducing the false air across the kiln riser duct, to increase the clinker output. With appropriate change in Raw-mix design, burnability has been improved, resulting in kiln output increase. Raw mix design is kept flexible to choose the right design, depending on fuel mix. The liquid content in the raw mix is increased to increase the kiln output.	Line-I Clinker capacity is proposed to be increased from 3050 TPD to 4000 TPD
With appropriate change in Raw-mix design, burnability has been improved, resulting in kiln output increase. Raw mix design is kept flexible to choose the right design, depending on fuel mix. The liquid content in the raw mix is increased to increase the kiln output	Line-2 Clinker capacity is proposed to be increased from 3800 TPD to 5500 TPD

Some additional improvements which results in increased clinker production are as follows:

Line-I :

- Preheater fan impeller, motor and Drive
- Cooler ESP and Cooler ESP fan along with impeller, motor and drive
- Clinker Cooler
- Kiln gear box for increasing the kiln speed
- Raw Mill
- Kiln feed elevator
- Kiln feed measurement system
- Kiln coal transport blower
- Clinker transport conveyor

Line-II :

- Preheater fan impeller,Motor, Drive and Transformer
- Cooler vent fan impeller , motor and Drive
- RABH fan impeller, motor and Drive
- Kiln feed Elevator
- Kiln feed measurement system
- Kiln coal conveying blower
- Clinker Cooler
- Kiln main drive gear box for increasing speed

Proposed Layout is given as **Fig. 3.1**.

Fig. : 3.1 Proposed Layout

For the Cement production, CVRM-1 (180 TPH) will be upgraded to LSKS -66 Classifier and its capacity will be 240 TPH with new Classifier. The Ball Mills 2 & 3 with 87 TPH, are proposed to be increased to 130 TPH with Roller Press. In Line-2, CVRM-II with the capacity of 305 TPH will be modified with the scatter ring design, louver area reduction & other process optimizations and better grindability. Clinker capacity will be 340 TPH. Further, with new Classifier, proposed to increase this capacity to 400 TPH. This will cater to overall 5.814 MTPA cement requirement from Line-I and Line-II together. Also, with Composite Cement production, the proposed 5.814 MTPA with 3.230 MTPA Clinker is easily achievable.

The Raw Materials requirement of the Cement Plant on Expansion is as detailed in **Table 3.4**.

Table : 3.4 Raw Materials, Source and Mode of Transportation – On Expansion

Sl. No.	Raw Material	Source	Quantity, MTPA
1	Limestone	Captive Limestone Mines in Trichy & Ariyalur Districts	16300
2	Fire Clay	Local Market	325
3	Lignite/ Petcoke / Coal	Neyveli Lignite Corporation (NLC)/ Imported/ Local Coal Mines	2200/ 1300/ 1800
4	Synthetic and Chemical Gypsum	IL&FS & Greenstar Fertilizers, Thoothukudi	450
5	Fly ash	NLC, IL&FS, North Chennai Thermal Power Station	5000
6	Slag	Jindal Steel Plant, Salem	600

The **Material Balances for Lines I & II, on Expansion,** are appended.

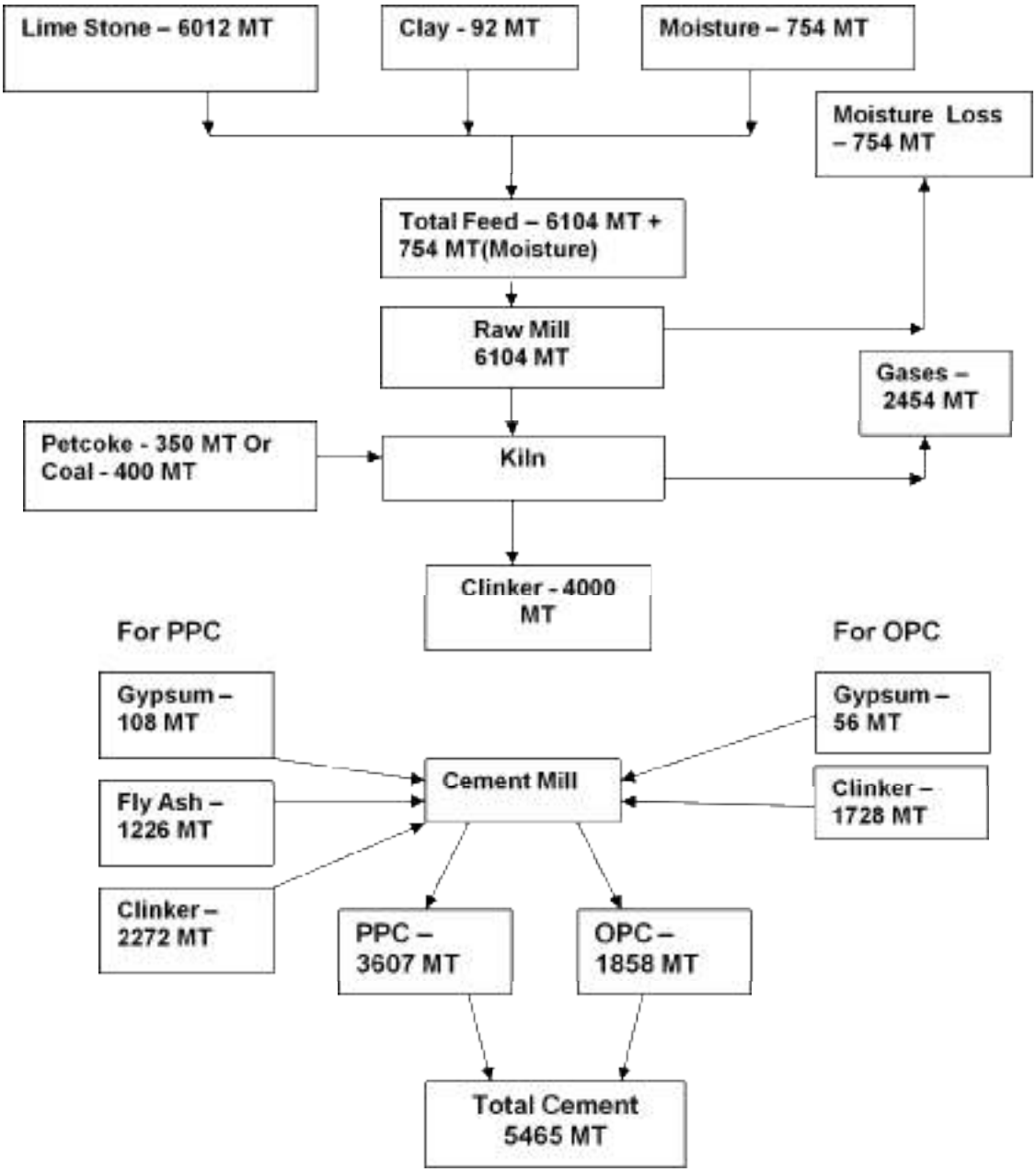
3.3 Proposal Benefits

Environmental Benefits : Optimisation of Process, Modernisation of existing Technology and Upgradation of existing Machineries so as to increase the Clinker and Cement Productions without any major Construction and major Equipments additionally.

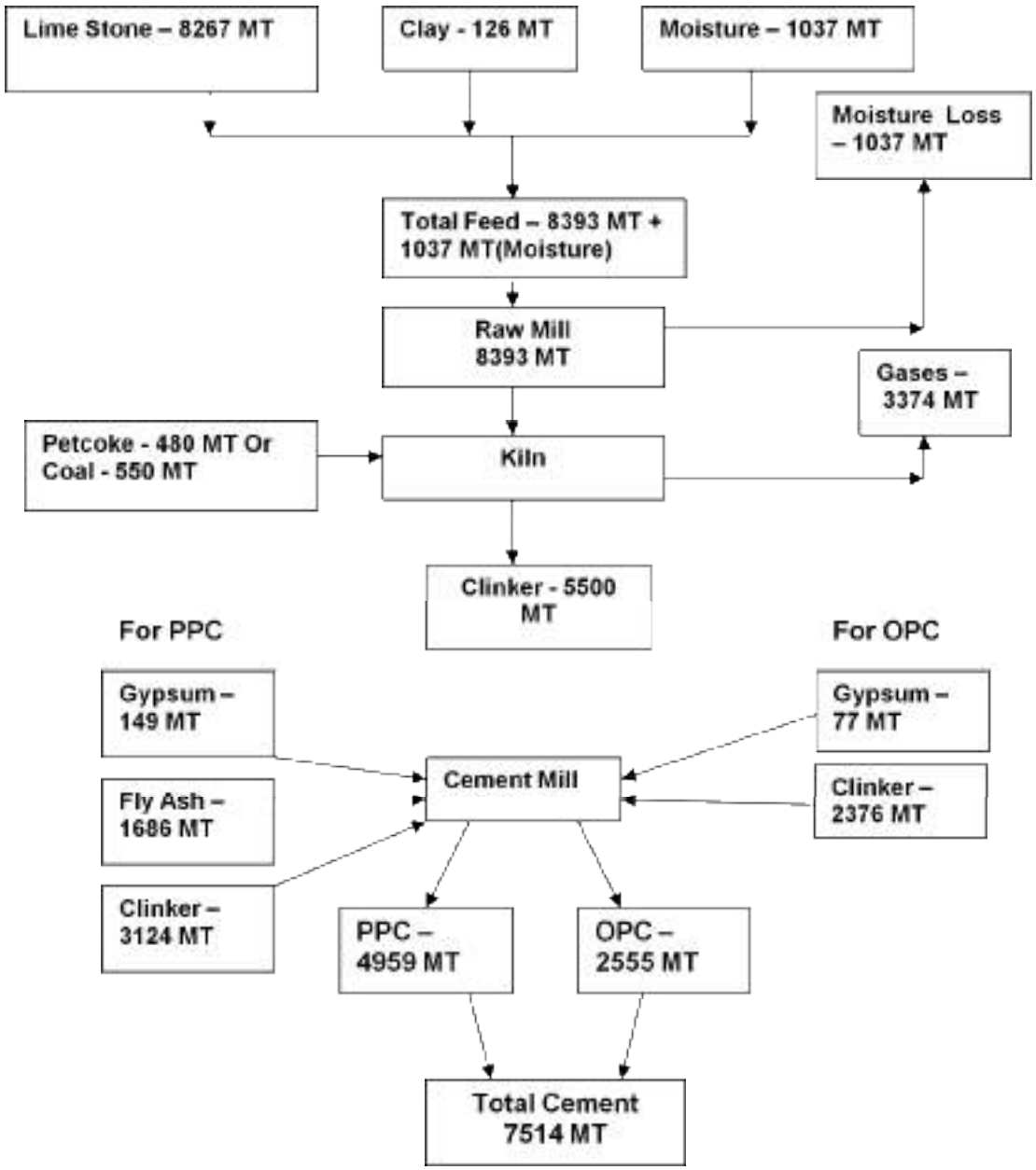
Financial Benefits : The Unit can enhance the Plants productivity within the existing Infrastructures. There will be a positive impact due to the proposal by improved local and regional economy.

Social Benefits : Presently, there are **773 Employees working in the Cement Plant** and another **141 Employees working in the Power Plants** (including Contract Workers), thus, **total 914 Employees** at Dalmiapuram. The Plants also generate about 500 Indirect Employments.

Typical Material Balance for Line-I



Typical Material Balance for Line-II



3.4 Type of Project

The Modernisation and Expansion activities are proposed within the existing Plant Premises **with no additional land and, no major Construction** for the additional Clinker and Cement Production. As per the Environmental Impact Assessment Notification 2006, all Cement Plants with >1.0 MTPA capacity have been kept at Sl. No. 3 (b) under Category 'A' for the Environmental Clearance from the Ministry of Environment, Forest and Climate Change (MoEFCC). Accordingly, Form-1, Feasibility Report and other required Documents are submitted to the Ministry to determine TOR for the EIA Study.

3.5 Location & Environmental Setting

The area falls in Survey of India Topo Sheet No. **58 J/13** (**Figs. 1.2**). For effective Cumulative Study including Cement Plant, CPPs and Captive Mines, the Study Area considered are shown in **Figs. 1.3-1.4**. DCBL Cement Plant location in High Resolution Satellite Imagery is given as **Plate V**. The region falls in Seismic Zone II. The Latitude and Longitude details are :

Cement & Power Plants :

Latitude	:	N 10°57'46" to 10°58'19"
Longitude	:	E 78°56'37" to 78°57'14"

There are **no eco sensitive areas** like National Parks, Wildlife Sanctuaries, Reserved Forests, Biosphere Reserves, Elephant Corridor, Mangroves, Archaeological/Historical Monuments, Heritage Sites, etc. within 10 km from the Plant boundary. **Karaivetti Bird Sanctuary is located at a distance of 8.9 km and its Buffer Zone at 8.1 km in East-northeast.**

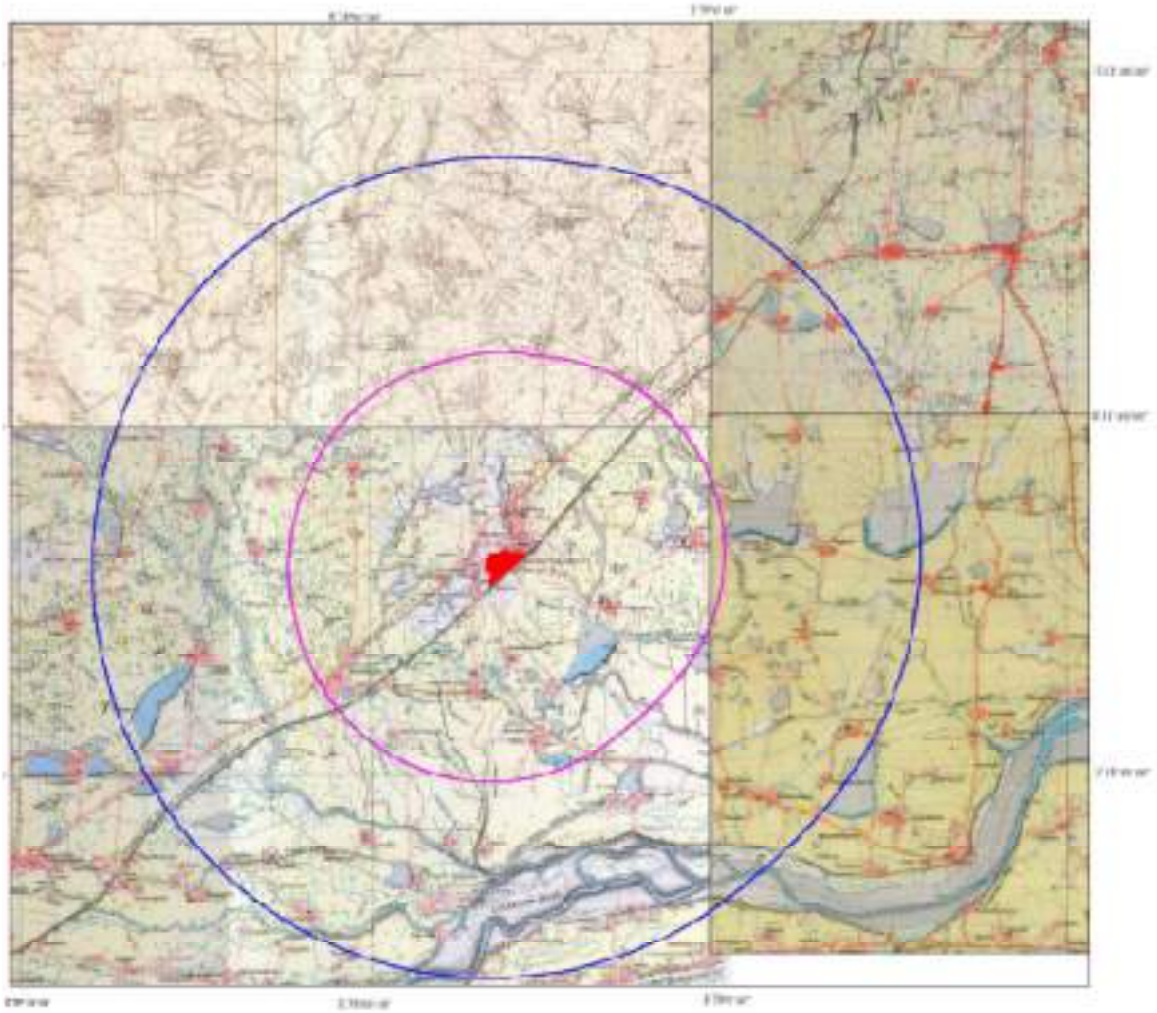
Physiography : The general elevation of the Plant area is between 75-87 m and study area is between 40 m to 120 m above MSL (aMSL). The elevation contour indicates the area is sloping towards south. There is no hillocks noticed in the study area.

Drainage: There is **no nallah crossing at the Plant Area**. The **River Coleroon/Kollidam River** is the major river course flowing west to east at southern side at a distance of 7.9 km distance in south. River Cauvery flows at 10.9 km in south direction. Pullambadi Canal flows in the southern side of the Plant (@ 2.1 km-SW). The Seasonal nallahs which drain the Plant area are Uppar Odai/Andi Odai (4.3 km in NE), Maan Odai (2.0 km in NE), Uppu Odai (1.5 km in W) and Nandiyar Nallah (7.5 km in W), etc. The surface waters from the area flows towards southeast and confluences with River Coleron. All **the rivers are seasonal** and there is no perennial river in this area.

Trichy-Chidambaram National Highway (NH)-81 (earlier NH-227) runs at a distance of 0.4 km in the west. Southern Railway BG Line connecting Chennai Egmore-Trichy-Kanniyakumari runs at a distance of 0.1 m in the east adjacent to the Plant. Kallakudi Palanganatham is the nearest railway station. Ariyalur Railway Station is at 23 km in NNE direction. Trichy is the nearest Airport at 30 km in southwest. Chennai Airport is at 258 km in NNE and Chennai Port is at 275 km in NNE direction. Karaikkal Port is 100 km in the east.

Dalmia Cement (Bharat) Limited
Modernisation of Dalmiapuram Cement Plant

Fig. . 1.2 Topo Map



SCALE - 1 : 50,000

Toposheet No :-

58 J/13,58 I/16 58 M/4 & 58 M/3

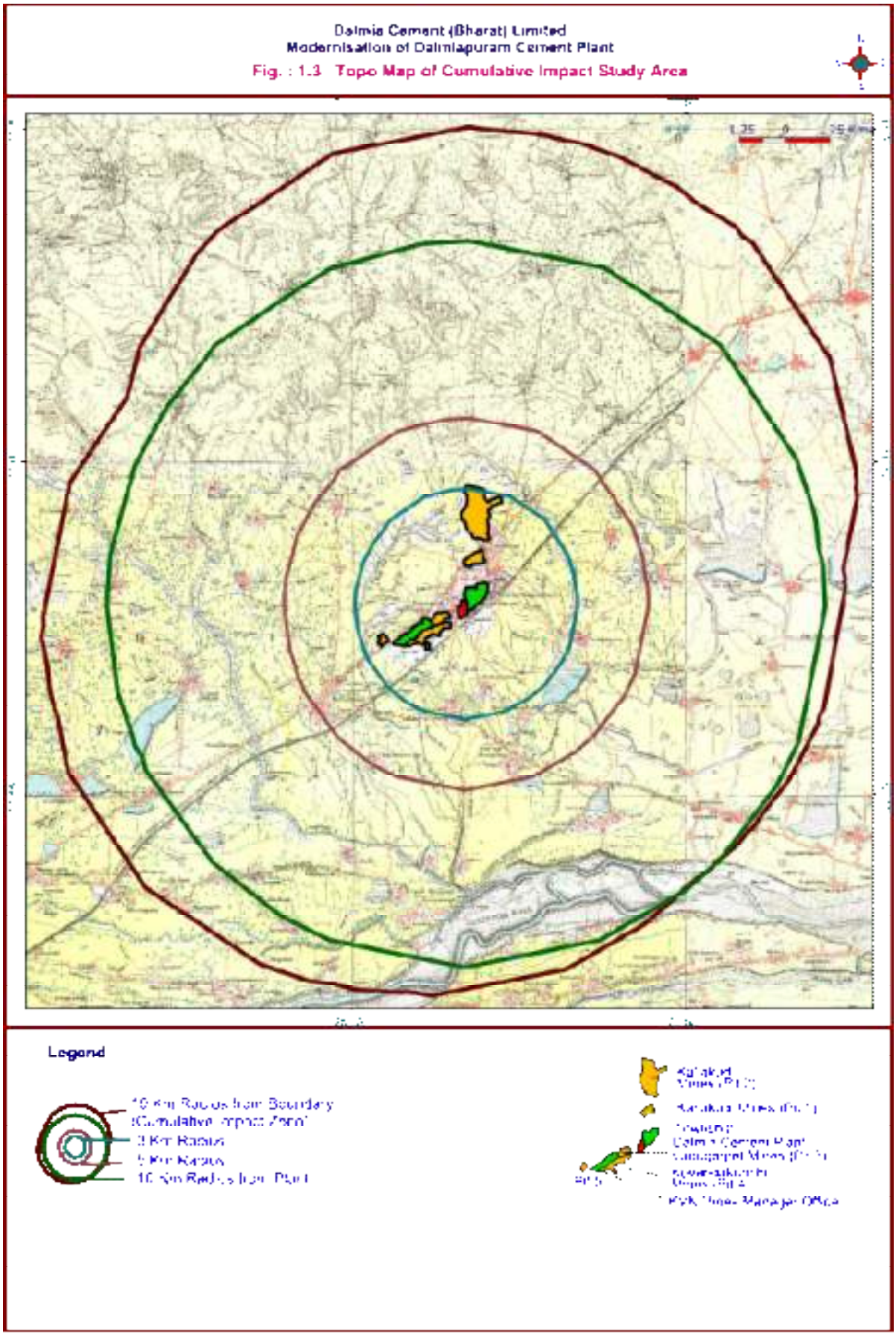
Legend

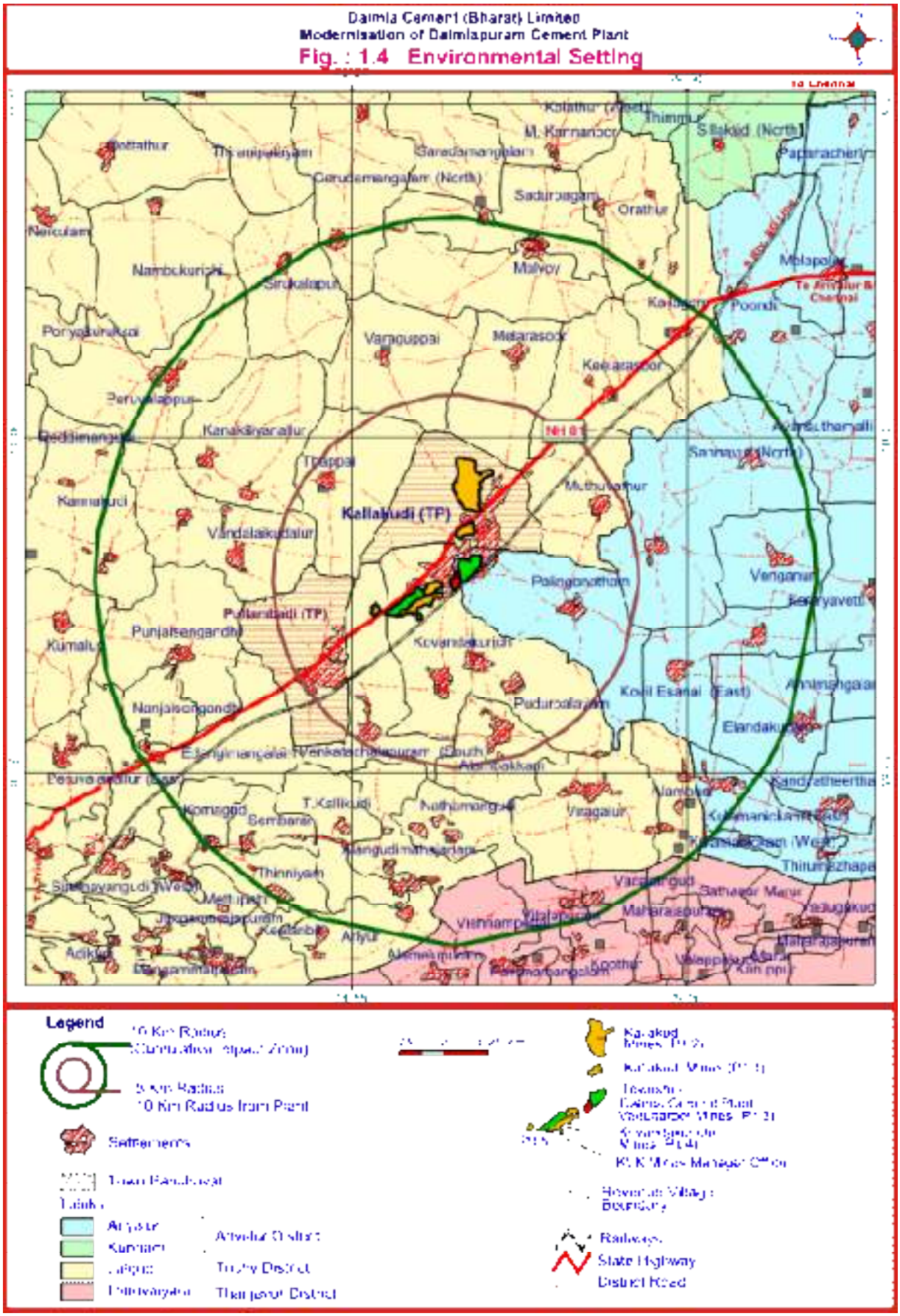
- PLANT AREA

- 10 KM RADIUS

- 5 KM RADIUS

INDEX


Dalmia Cement (Bharat) Limited
Modernisation of Dalmiapuram Cement Plant
Fig. : 1.3 Topo Map of Cumulative Impact Study Area
Legend


Dalmia Cement (Bharat) Limited
Modernisation of Dalmiapuram Cement Plant
Fig. : 1.4 Environmental Setting
Kallakudi (TP)
Pudarsadi (TP)
Legend
Settlements
Railways
State Highway
District Road

The major settlements with in the study area are Kallakudi Town Panchayat (Population-11,604; 2011 Census) @ 0.4 km in north and Pullambadi Town Panchayat (Population-10,241) @ 3.5 km in SW direction. Palinganatham village is at 2.5 km in the east from the Plant. District Head Quarters Ariyalur is at 22 at 22 km in NE. State Head Quarters Chennai is located at a distance of 250 km.

Industries within 15 km Radius : Dalmia Cement along with its Power Plants and its Kallakudi-Kovandakurichi Mines and Dalmia Refractories Ltd. (adjacent to Dalmia Plant in north) are the major industries in the Region. DCBL Kallakudi Pit-1 is at 0.3 km in NNW direction, Kallakudi Pit-2 is at 1.0 km in north, Kavandakurichi Pit-3 (Vadugarpet) Mine is at 0.4 km SW and Pit-4 (Kovandakurichi) is at 1.1 km in SW direction. Dhandapani Cement Pullambadi Mines are located at 3.2 km in SW.

3.6 Alternative Sites

The Modernisation and Expansion activities are proposed within the existing Industry premises and therefore, no alternate site has been considered.

3.7 Size/Magnitude of Operation

Due to the Modernisation and Upgradation measures, the **Clinker Production** will be increased from exiting **2.410 MTPA to 3.230 MTPA** and accordingly, the **Cement Production** will also be increased from existing **4.020 MTPA to 5.814 MTPA**.

3.8 EMP Measures

Air : Adequate Air Pollution Control Measures (APC) measures to control PM emissions are provided in the Cement Plant viz. Electrostatic Precipitators to Clinker Cooler & Boilers, Bag House to Raw Mill/Kiln, Coal Mill, Cement Mill, etc. to control **PM emission <30 mg/Nm^3**. The dust collected from Bag House/Filters, etc. are totally recycled in the process for cement manufacturing.

Water : The total water requirement for the Cement Plants, Captive Power Plants and Colony is 2567 KLD (average) out of which fresh water demand is 2,225 KLD. This requirement of water is presently drawn from Coleroon River through the existing water supply system to the plant. The **additional water demand of 480 KLD** (**Table 3.5**) will also be met from the permitted source only and **within the permitted 3,200 KLD**.

Table : 3.5 Additional Water Demand– On Expansion

Sl. No.	Section	Cu.m/hr	KLD
1	KHD Cooler	6	144
2	FLS Cooler	4	96
3	CVRM-1	5	120
4	CVRM-2	5	120
		Total	**480**

Solid Wastes : No change in the Quantity of Solid Wastes Generation, Storage and its Disposal due to the proposal.

4.0 Site Setting & Analysis

4.1 Connectivity

The Plant is well connected by road & rail modes. The Plant is accessible from the adjacent State Highway NH-81 connecting Chidambaram with Trichy. Southern Railway BG Line runs parallelly adjacent to the Plant in the east. The nearest Airport is Trichy at a distance of 30 km in the southwest.

4.2 Land Form

The dry crop occupies the majority of the study area which is about 57.18% of the study area. The wet crop is noticed along the flood plains which is about 8.32% of the study area. Most of the tanks and river in the study area contributes wet crop. Water body occupies about 8.55% of the study area, which indicates the economic development. About 4.08% of the study area is covered by built-up land and about 2.32% land remains fallow. The Mines occupies about 0.66% of the study area. The salt affected land occupies about 5.00% and about 5.87% of the study area is occupied with plantations. The Revenous land occupies about 3.78% of the study area and 4.14% land is with scrub whereas 0.10% land is without scrub.

4.3 Existing Infrastructure

The area around the Plants and Mining lease boundaries are dry, barren or rocky and non-mineralised terrain. Dalmia Cement along with its Power Plants & Mines and Dalmia Ceramics & Chemical Industries (adjacent to Dalmia Plant) are the only major industries in the Study Area.

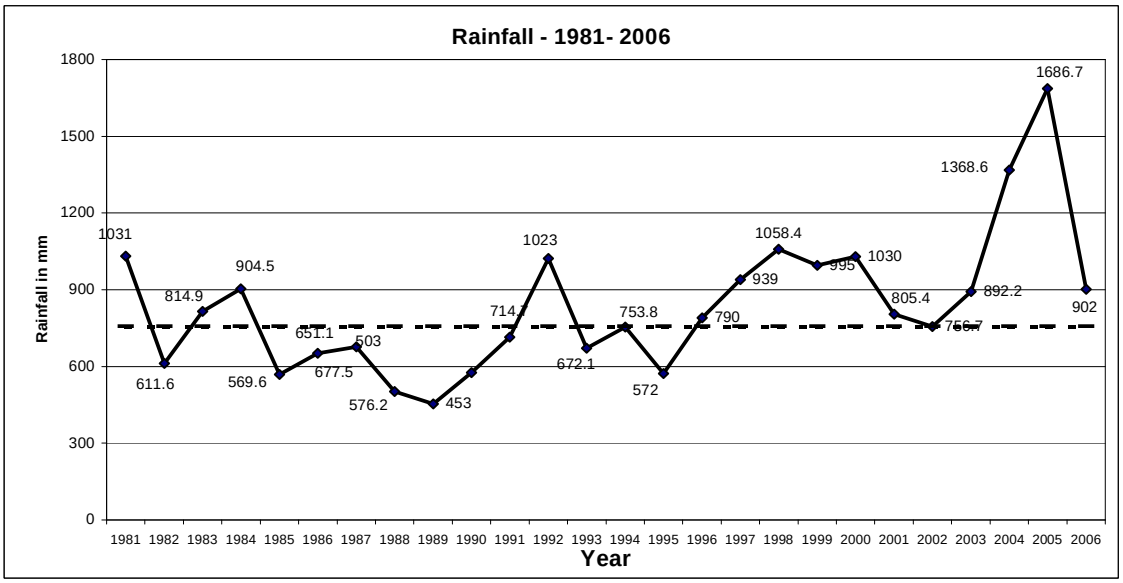
4.4 Soil Classification

The soils in the study area are classified into 5 types. They are Deep moderately drained calcareous cracking clay soil, Very deep imperfectly drained cracking clayey soil, Very deep moderately well drained calcareous cracking soil, Very deep well drained clayey soils, Very deep well drained loamy soils.

4.5 Climatic Data from Secondary Source

Sub-tropical climate prevails over the study area. The nearest IMD Station is Trichy Airport at a distance of 35 km. The IMD Data for the last decade are given in the Annexure. The temperature is maximum during March to May and it drops from June onwards. The maximum temperature ranges from 40°C to 44°C and the minimum temperature from 19°C to 24 °C.

The nearest raingauge station is Pullambadi. The 70 years normal annual rainfall in the area is around 756.6 mm. The study area receives fairly good amount of rainfall during Northeast monsoon. The yearly rainfall data (1981-2006) of Pullambadi rain gauge station collected from the State Government Department is presented below:



Around 52 % of the rainfall occurs during North East monsoon and the remaining rainfall occurs during Southwest and Transitional period. The Isohyetal map of the project area (**Fig. 3.1**) depicts that the project site lies in the 800D860 mm rainfall range. The highest rainfall is noticed in the northwestern side of the study area.

The probability of occurrence of normal rainfall over the study area has been studied. It is observed that the chances of receiving normal annual rainfall are in the range of 40-45 %.

During rainy season, the area is being drained by Uppuodai Nalla/Andi Odai & Man Odai in the northeast and Nandiar River in the southwest which confluences with River Coleroon flowing in the southeast at about 8.5-10 km to the mines.

4.6 Social Infrastructure Available

The Administrative Units of 10 km radius zone comprises of parts of Lalgudi Taluk of Trichy District, Ariyalur and Kunnam Taluks of Ariyalur District and Thiruvaiyaru Taluk of Thanjavur District. All basic amenities exists the Study Area.

5.0 Planning Brief

5.1 Planning Concept & Amenities/Facilities

The Modernisation and Expansion activities are proposed within the existing Plant Premises **with no additional land and no major Construction** for the additional Clinker and Cement Production. Existing Infrastrutures in the Cement Plant are adequate for the Proposal.

5.2 Land Use Planning

There is no major change in Land Use Pattern of the Plant on Expansion.

6.0 Proposed Infrastructure

6.1 Industrial Area

The Modernisation and Expansion activities are proposed within the existing Plant Premises **with no additional land and no major Construction**.

6.2 Residential Area

A well established Township exists near the Plant.

6.3 Social Infrastructure

DCBL CSR Committee exists as per the provisions notified by the **Ministry of Corporate Affairs on February 27, 2014**. Based on the CSR Committee and declared CSR Policy of the Company, the following CSR activities will be covered and Reported (& also displayed in the Company website) :

- ❖ Eradicating extreme hunger and poverty.
- ❖ Promotion of education & vocational skills.
- ❖ Ensuring environmental sustainability.
- ❖ Contribution to the Prime Minister's National Relief Fund or any other fund set up by the Central Government or the State Governments for socioeconomic development and relief.

The CSR initiatives of DCBL and CSR Budget spent in the last 5 years period (**Table 6.1**) are appended.

Table : 6.1 CSR Budget Spent

Sl. No.	Program	CSR/CER Amount Spent in Rs.				
		2014-15	2015-16	2016-17	2017-18	2018-19
1	Soil & Water Conservation	1,57,500	12,69,649	12,85,125	22,20,756	18,89,957
2	Energy Conservation	12,25,003	15,18,528	4,58,700	75,000	0
3	Livelihood	2,00,870	67,795	7,93,975	12,05,500	12,42,000
4	Social Development	17,68,333	39,46,338	10,61,147	15,70,256	1,80,534
5	Execution Cost	25,84,573	5,10,391	3,29,314	3,45,127	3,06,200
Total		**59,36,279**	**73,12,701**	**39,28,261**	**54,16,639**	**36,18,691**

7.0 Rehabilitation & Resettlement (R&R) Plan

The Project does not involve any R&R and thus no R&R Plan is envisaged.

8.0 Project Schedule & EMP Budget

8.1 Project Schedule

Project will be completed in about 24 months on approval of statutory clearances.

8.2 Project Cost

DCBL has invested already about Rs.1,321.51 Crores at Dalmiapuram Plant. The Project Cost for the Modernisation and Expansion activities will be an additional **Rs.76.11 Crores**.

An EMP Capital Budget of Rs.24.05 Crores has already been spent with an Operating Cost of Rs.2.25 Crores/Annum. On Expansion, an additional Rs.5.00 Crores will be allotted for the EMP Measures. A budget of 1% of the Project Cost will be allotted as **CER Budget**.

9.0 Analysis of Proposal

9.1 Financial & Social Benefits

Financial Benefits : The Unit can enhance the Plantos productivity within the existing Infrastructures. There will be a positive impact due to the proposal by improved local and regional economy.

Social Benefits : Presently, there are **773 Employees working in the Cement Plant** and another **141 Employees working in the Power Plants** (including Contract Workers), thus, **total 914 Employees** at Dalmiapuram. The Plants also generate about 500 Indirect Employments.

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