Environmental Inspection in Taiwan

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Outline

Chapter 1 Introduction

Chapter 2 Cement production

-pollution problem/index/critical checking point

Chapter 3 Mining operation

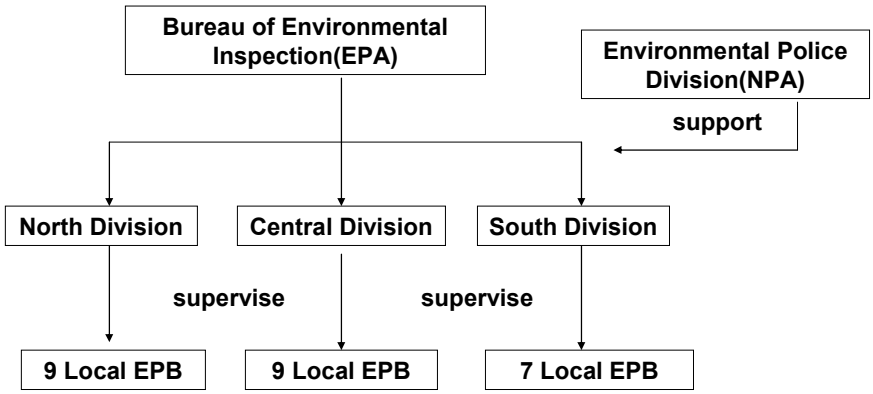
-pollution problem/index/critical checking point

Chapter 4 Details of Field Inspection

-air/water/waste/noise/fetor/soil

Chapter 5 Special Issue for cement factory use industrial waste as raw material

Chapter 1 Introduction



Environmental Inspection Organization Structure in Taiwan

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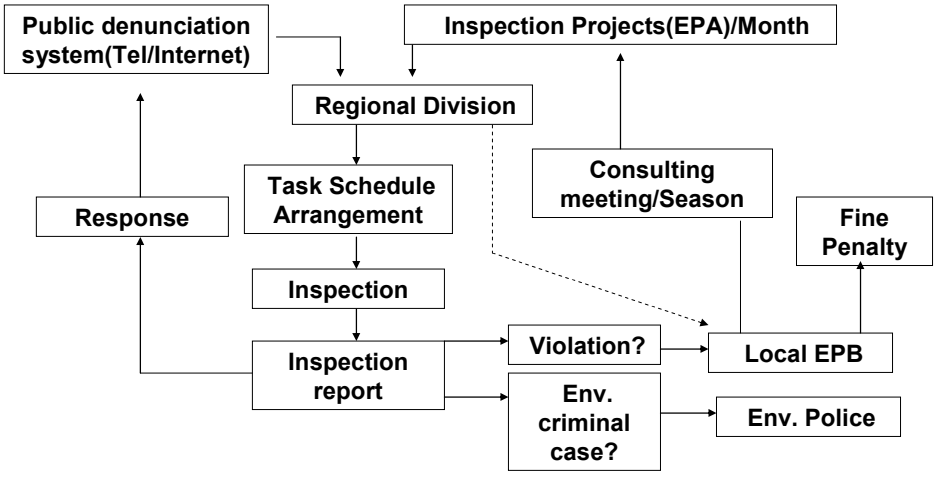
Chapter 1 Introduction



Mechanism of Environmental Inspection

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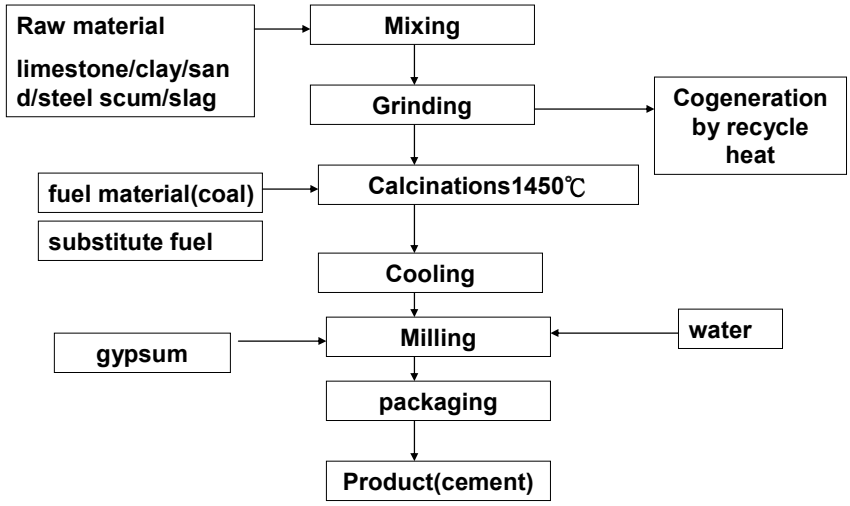
Chapter 2 Cement production



Cement production process

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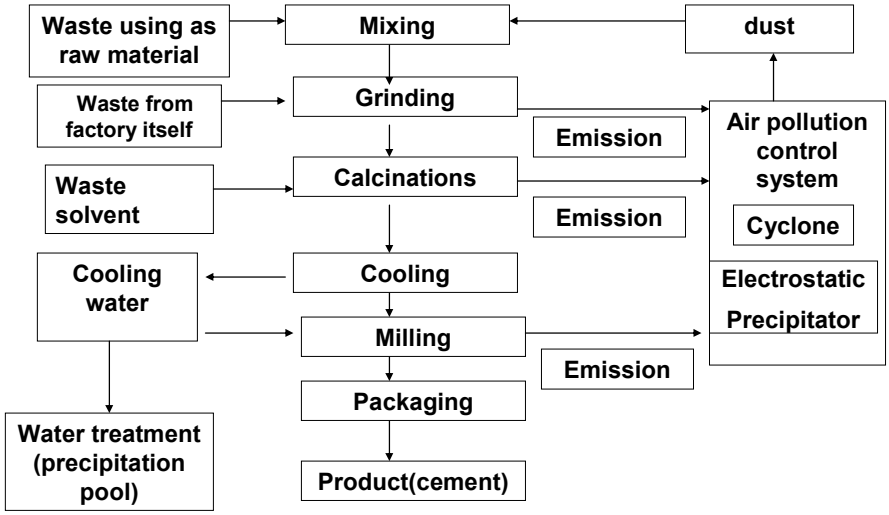
Cement production processes and type of pollution



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Pollution problem and pollution index(1)

item	source of pollution	index
Air pollution	dust from grinder /cooling system	Particle pollutant (Opacity)
	gas from Calcinations	Nitrogen Oxides(NOX)
	dioxin from waste solvent use as accessory fuel	Dioxin
Wastewater	cooling water	Temperature
	truck washed water	SS/COD/PH
	surface water by heavy rain	SS/COD/PH

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Pollution problem and pollution index(2)

Solid waste	dust collecting from air pollution control unit sludge from wastewater treatment facility Packaging Production equipment maintenance	Heavy metal content re useable hazardous/no hazardous
Noise	production equipment	peripheral boundary noise

Note:
BOD: Biochemical Oxygen Demand
COD: Chemical Oxygen Demand
SS: Suspended Solids
VOC: Volatile Organic Compounds

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Critical checking point(1)

Item		checking point	note
Air pollution	document checking	permit of air pollution control system	
		automatic emission monitoring system	1. continuously monitor their operations or air pollutant emissions conditions 2. connection of their monitoring facilities via the Internet to local EPB

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Critical checking point(2)

		monitoring and analysis report (each 6 month)	done by factory itself
		dedicated air pollution control personnel	
		air pollution control fees	every season
		fuel analysis report	content of sulfur(S)
	field checking	air pollution control unit	operating condition
		emissions pipe	watch and smell

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Critical checking point(3)

		local resident response	
		sampling and analysis	non periodic
Waste water	Document checking	permit of waste water treatment facility	
	field checking	discharge point	PH/ transparency
		capacity of precipitation pool	
		rain colleting system	
		treatment of sludge	use as raw material ?

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Critical checking point(4)

		local resident response	
		any illegal discharge point surround boundary	
	advance checking	water balance calculation	If illegal discharge point were suspect
	advance checking	wastewater treatment facility analyses/authentic ation	If illegal discharge point were suspect
	advance checking	under ground detective and exploration device	If illegal discharge point were suspect

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Critical checking point(5)

Solid waste	document checking	waste clearance and treatment plan	apply to local EPB when factory established
		waste online report data and manifest	online report via Internet when waste generated, storage, transported and treatment
		analyses report of waste content	If cement factory accept industry waste as raw material
	field checking	storage	
		sampling	If cement factory accept waste as raw material, analyses waste content.

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Critical checking point(6)

Underground water	document checking	monitoring and analysis report	done by cement factory according to EIA commitment
Noise	document checking	monitoring and analysis report	done by cement factory according to EIA commitment
	peripheral boundary	sampling and testing	in case of local resident complaints
Fetor	peripheral boundary	sampling and testing	in case of local resident complaints
Soil	document checking	monitoring and analysis report	done by cement factory according to EIA commitment

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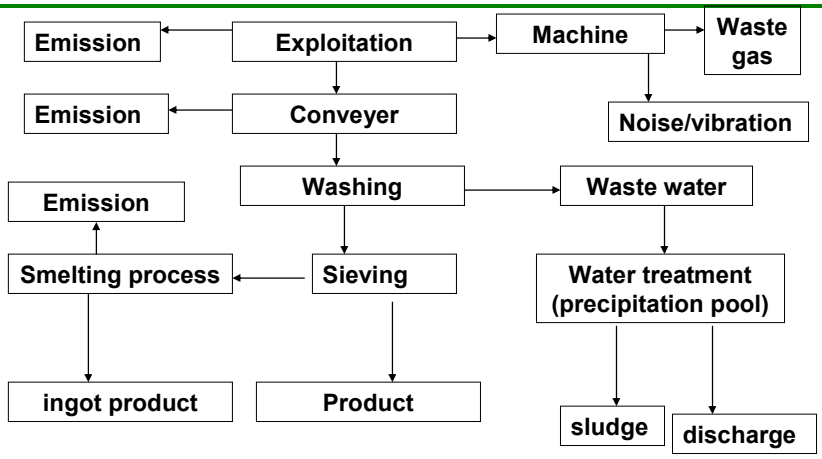
Chapter 3 Mining operation



Mining processes and type of pollution

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Pollution problem and pollution index(1)

Item	source of pollution	index
Air pollution	dust from mining exploitation	particle pollutant (Opacity)
	gas release from exploitation machine	particle pollutant /CO
	emission from smelting process	NOx, SOx, heavy metal
Wastewater	waste water generated from mineral washing unit	SS, COD,PH,temperature

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Pollution problem and pollution index(2)

Solid waste	Sludge from waste water treatment facility	heavy metal(in smelting process)
	dust collecting from air pollution control unit	heavy metal(in smelting process)
	slag from smelting process	heavy metal
	waste lubricant from mining machine	
Noise	exploration machine	peripheral boundary noise

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Critical checking point(1)

Item		checking point	note
Air pollution	For exploitation process		
		dust from mining exploitation	
		gas release from exploitation machine	
	For smelting process		
	document checking	permit of air pollution control system	

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Critical checking point(2)

		monitoring and analysis report (each 6 month)	done by factory itself
		dedicated air pollution control personnel	
		air pollution control fees	every season
		fuel analysis report	content of sulfur(S)
	field checking	air pollution control unit	operating condition
		local resident response	
		sampling and analysis	non periodic
		emissions pipe	watch and smell

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Critical checking point(3)

waste water	field checking	discharge point	PH/ transparency
		capacity of precipitation pool	
		treatment of sludge	
		rain colleting system	
		local resident response	
		any illegal discharge point surround boundary	

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Critical checking point(4)

	advance checking	water balance calculation	If illegal discharge point were suspect
	advance checking	wastewater treatment facility analyses/authentication	If illegal discharge point were suspect
	advance checking	under ground detective and exploration device	If illegal discharge point were suspect
Solid waste	document checking	waste clearance and treatment plan	apply to local EPB when factory established
		waste online report data and manifest	online report via Internet when waste generated, storage, transported and treatment

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Critical checking point(5)

	field checking	Storage	
Underground water	document checking	monitoring and analysis report	Done by cement factory according to EIA commitment
Noise	document checking	monitoring and analysis report	Done by cement factory according to EIA commitment
	peripheral boundary	sampling and testing	In case of local resident complaints
Fetor	peripheral boundary	sampling and testing	In case of local resident complaints
Soil	document checking	monitoring and analysis report	done by cement factory according to EIA commitment

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Chapter 4 Details of Field Inspection

Air pollution

Basic requirement

Emission standard

Air pollution control system permit

Automatic emission monitoring system

Fuel restriction

Emission standard for cement industry in Taiwan

Concentration of Particle Pollutant and Opacity value should under the regulated limit.

NOx value should under 350ppm(10%O_2)

(For general industry, pollutant control item also include SOX ,CO and Dioxin)

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Emission standard for cement industry in Taiwan

Air Pollutant	Source of Pollutant	Emissions Pipe		Emission$_2$ Oxygen ref.
Particle Pollutant	pre-heating, grinding and cooling unit (Weight and Concentration)	Concentration *C* (mg/Nm^3)	Emissions Displacement *Q* (Nm^3/min)	10% for pre-heating unit
		250	30 under	
		215	50	
		175	100	
		142	200	
		126	300	
		108	500	

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Air Pollutant	Source of Pollutant	Emissions Pipe		Emission$_2$ Oxygen ref.
		C (mg/Nm^3)	*Q*(Nm^3/min)	
		94	800	
		88	1000	
		72	2000	
		64	3000	
		55	5000	
		48	8000	
		45	10000	
		36	20000	
		32	30000	
		28	50000	
		25	70000 above	

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Air Pollutant	Source of Pollutant	Emissions Pipe	Emission$_2$ Oxygen ref.
	pre-heating unit and grinder (Opacity)	Continuous automatic monitoring: 6 minute monitoring values for daily opacity may not exceed 20% of the accumulated time by over 4 hours.	
	cooling unit(Opacity)	Continuous automatic monitoring: 6 minute monitoring values for daily opacity may not exceed 10% of the accumulated time by over 4 hours.	
	Other source (Opacity)	opacity may not exceed 10%	

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NOx	Existing facility	NSP type	650ppm
		SP type	500ppm
	New facility	Chimney height 75M~85M	350ppm
		Chimney height 85M~100M	400ppm
		Chimney height >100m	450ppm
	All kiln	350ppm	

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Dioxin emission standard in Taiwan

Pollution source	Emission standard (ng-TEQ/Nm^3)	Date of enforcement
Existing facility	2 · 0	2007.01.01
	1 · 0	2008.01.01
New facility	0 · 5	-
Waste incinerator	0.1	-
If cement factory use waste solvent as fuel, the dioxin concentration release limit is same as waste incinerator which is 0.1 ng-TEQ/Nm^3		

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Automatic emission monitoring system

Automatic emission monitoring system requirement for Cement industry in Taiwan

process	Stationary Pollution Source	Monitoring item						
		Opacity	So 2	Nox	Oxygen	discharge flow rate	CO2	CO
Cement process	pre-heating unit/ grinder	●		●	●	●		
	Cooling unit	●						

data recording frequency > 6 min

total time of Opacity > 20% should under 4 hr

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Fuel restriction

Fuel for using in cement industry should meet the standard as below

Area	content of sulfur(S)
Megalopolis/crowded cities	<0.5%
Other area	<1.0%

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