



Air District Permits

NSCAPCD Overview
with geothermal & asphalt projects.

What are Air Permits?

- Legally binding documents that include enforceable limits on emissions at a facility.
- Any facility that emits air pollutants above certain levels is required to have an air permit.
- Permits specify how facilities must operate their pollution control equipment, the pollutant limits they must meet, and how they must monitor and report their emissions to show compliance.
- Permits are intended to protect human health and the environment by limiting pollution so our air quality can achieve state and federal standards.

District Authority

Ambient Air where Public has Access

- (EPA) defines “ambient air” as “that portion of the atmosphere, external to buildings, to which the general public has access.”
- EPA recognizes “An exemption from ambient air is available only for the atmosphere over land owned or controlled by the source and to which public access is precluded by a fence or other physical barriers”

Stationary Sources

The EPA defines a stationary source as any building, structure, or facility that emits or may emit air pollutants.

Excludes sources that are:

- “portable” moveable
- “temporary” limited time at a single location
- “mobile” motor vehicles (cars, trucks planes, trains, boats, off road)

* Districts can require portable and temporary sources to get a stationary source permit if circumventing stationary source permitting.

Cooperative Govt Authorities

Districts are mostly autonomous in their permit and other programs if their SIP elements (rules) are approved and if they faithfully implement their programs.

CARB Authority

CARB has retained authority for itself to permit:

- **Portable, mobile, temporary**
 - **Portable Equipment Registration Program (PERP)**
- **GHG and carbon pollutants**

CARB oversight role is to step in when Districts don't implement their programs as written.

CARB works with Districts regarding state SIP & compliance with state rules.

EPA Authority

Primary authority of federal rules and permitting that applies to Title V and PSD sources.

EPA included in public notice and can comment for major sources.

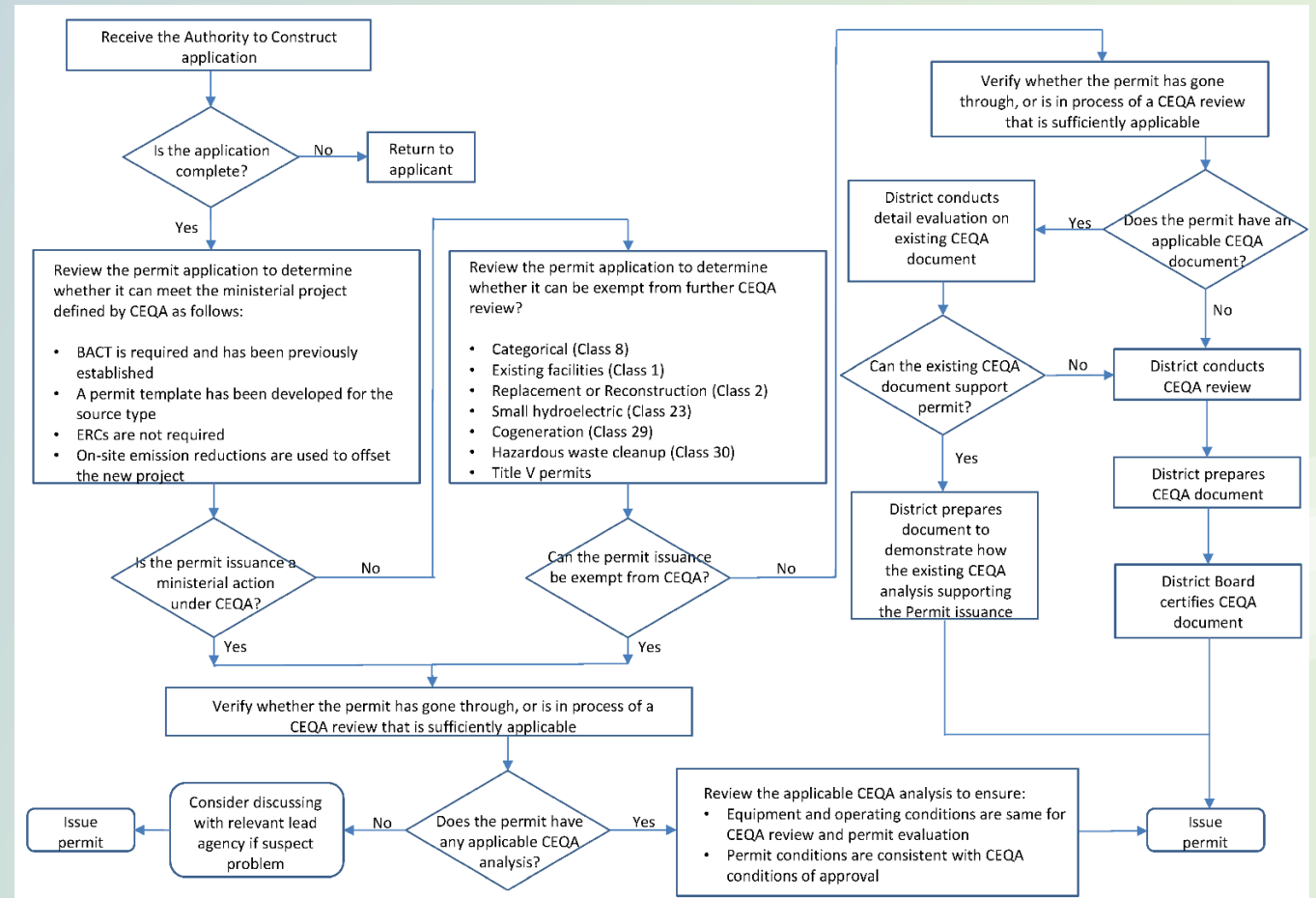
Can “over file” if District doesn't take adequate enforcement action.

Can “FIP” if District rules or SIP are not adequate & withhold federal funds to the state.

Review CEQA

Typically Exempt:

- Ministerial – BACT already established, permit template
- Categorical CEQA exemptions
- Has gone through or in process of sufficient CEQA review





NSR – New Source Review

A **pre-construction** permitting process under the Clean Air Act that requires industrial facilities to obtain permits **before** building new facilities or significantly modifying existing ones.

Ensures installation of pollution control technology to protect air quality and prevent further degradation, particularly in areas not meeting air quality standards (nonattainment areas).

Projects Permitted in 2 Permits/Steps

ATC – Authority to Construct. Authorizes construction. Permit defines construction requirements. May include performance testing, and notification requirements prior to startup. District may perform an inspection before operational startup.

OP – Operating Permit. Authorizes operation. Permit defines ongoing operations with operational parameters (throughput limits, hours of operation) and emission limits.

“Hybrid.” May issue ATC and OP in 1 step if process warrants.

- Example: off-the-shelf generator (already constructed).

Technical Review. District staff crafts a technical review for each project to review applicable District, State & Federal requirements with as basis with recommendation to issue/deny a permit for the proposed project.

Anatomy of a Permit

Northern Sonoma County Air Pollution Control District
Title V Operating Permit

150 Matheson Street
Healdsburg, CA 95448
(707) 433-5911

Proposed
TITLE V OPERATING PERMIT

Central California Power Agency No. 1
Coldwater Creek
Geothermal Power Plant and Steamfield

PLANT ADDRESS:
9500 Coldwater Creek Road
(707) 928-5291

MAILING ADDRESS:
P.O. Box 15830
Sacramento, CA 95852-1830

Responsible Official - Kenneth Byers, Director
Facility Contact- Ted Huff

Type of Facility: Geothermal Power Plant and Steamfield
Primary SIC: 4911
Product: Electricity

ISSUED BY THE NORTHERN SONOMA COUNTY AIR POLLUTION CONTROL DISTRICT

Barbara A. Lee, Air Pollution Control Officer _____ Date _____

Title
Project Location/Address
Type of facility / SIC
Responsible Official
Issue signature & date

Equipment list and controls
Plant wide requirements
Equipment requirements
Emission Limits
Operational limits
Monitoring and Recordkeeping
Testing & test methods
Ambient Monitoring
Reporting
Glossary



Pollutants Regulated

National AAQS

- The CAA requires the EPA to set **National Ambient Air Quality Standards (NAAQS)** for certain pollutants that are common in outdoor air, are considered harmful to public health and the environment, and that come from numerous and diverse sources.
- The EPA has established NAAQS for six principal pollutants, or "criteria pollutants"

- 1. Ozone**
- 2. Sulfur Dioxide (SO₂)**
- 3. Carbon Monoxide (CO)**
- 4. Nitrogen Dioxide (NO₂)**
- 5. Lead (Pb)**
- 6. Particulate Matter (PM-10 & PM-2.5)**



Pollutants Regulated

CA AAQS

- California law mandates **California ambient air quality standards (CAAQS)**, which are often more stringent than national standards.
- **California** has established AAQS for **ten** principal pollutants, or "criteria pollutants"
 1. Ozone
 2. Sulfur Dioxide (SO₂)
 3. Carbon Monoxide (CO)
 4. Nitrogen Dioxide (NO₂)
 5. Lead (Pb)
 6. Particulate Matter (PM-10 & PM-2.5)
 - **H₂S**
 - **Visibility Reducing Particles**
 - **Vinyl Chloride**
 - **Sulfate**



Pollutants Regulated

HAPs / Toxics

EPA and CARB each maintain lists of **HAPs** and **Toxics**.

Hazardous Air Pollutant (HAP) – toxic air pollutant that can cause serious health affects or environmental damage.

Toxic Air Pollutant (toxic or TAC) - has the potential to increased mortality or serious illness through inhalation exposure.

HAPs & Toxics are same class of pollutant, but EPA lists 188 and CA lists 200+. Essentially same list, but CA adds additional specific process pollutants.

- Example of some toxics/HAPS: benzene, mercury, toluene, dioxins, asbestos.



HRA – Health Risk Assessment

HAPs & Toxics

- HRA is a calculation method to prioritize risk, including determination of **acute and chronic cancer exposure** for nearby residents & members of the public.
- Calculated using risk factors provided by OEHAA. Can be calculated by hand, spreadsheet, or air dispersion model for increased accuracy.
- NSCAPCD reviews and calculates HRA for each permit via a screen method followed by calculation and or model.
- High risk facilities are required to add additional emissions controls, perform public notice, and may be denied a permit.
- HRA values included in annual AB 2588 Toxics Hots Spots report and some CTR reporting.

Assessing a Proposed Project

“**Storyboard**” the facility. Make a process flow diagram and/or spreadsheet list identifying all equipment from start to tail pipe (exhaust pipe).

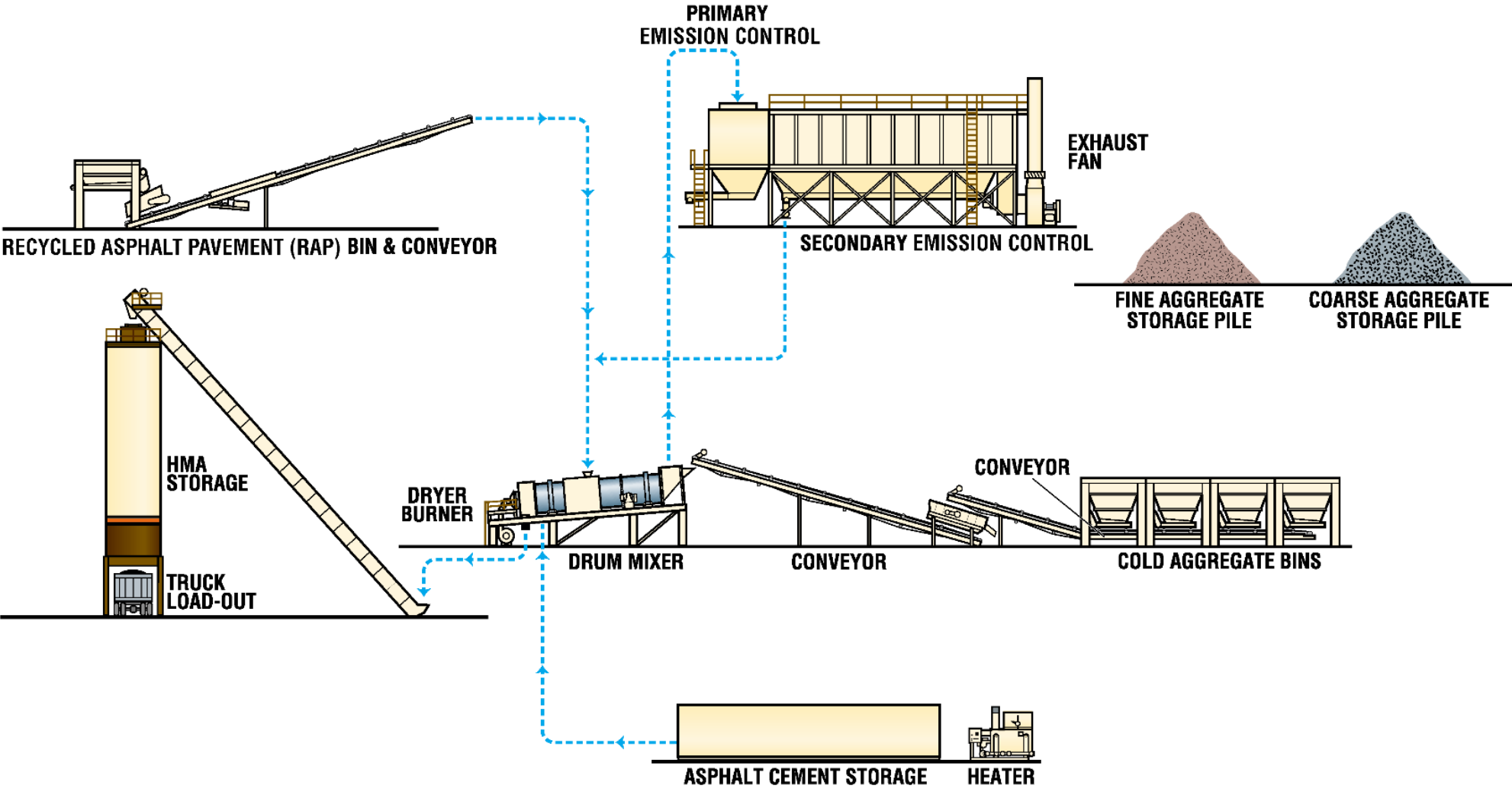
Identify **emission release points**:

- Stack fugitive
- Process fugitive
- Area fugitive

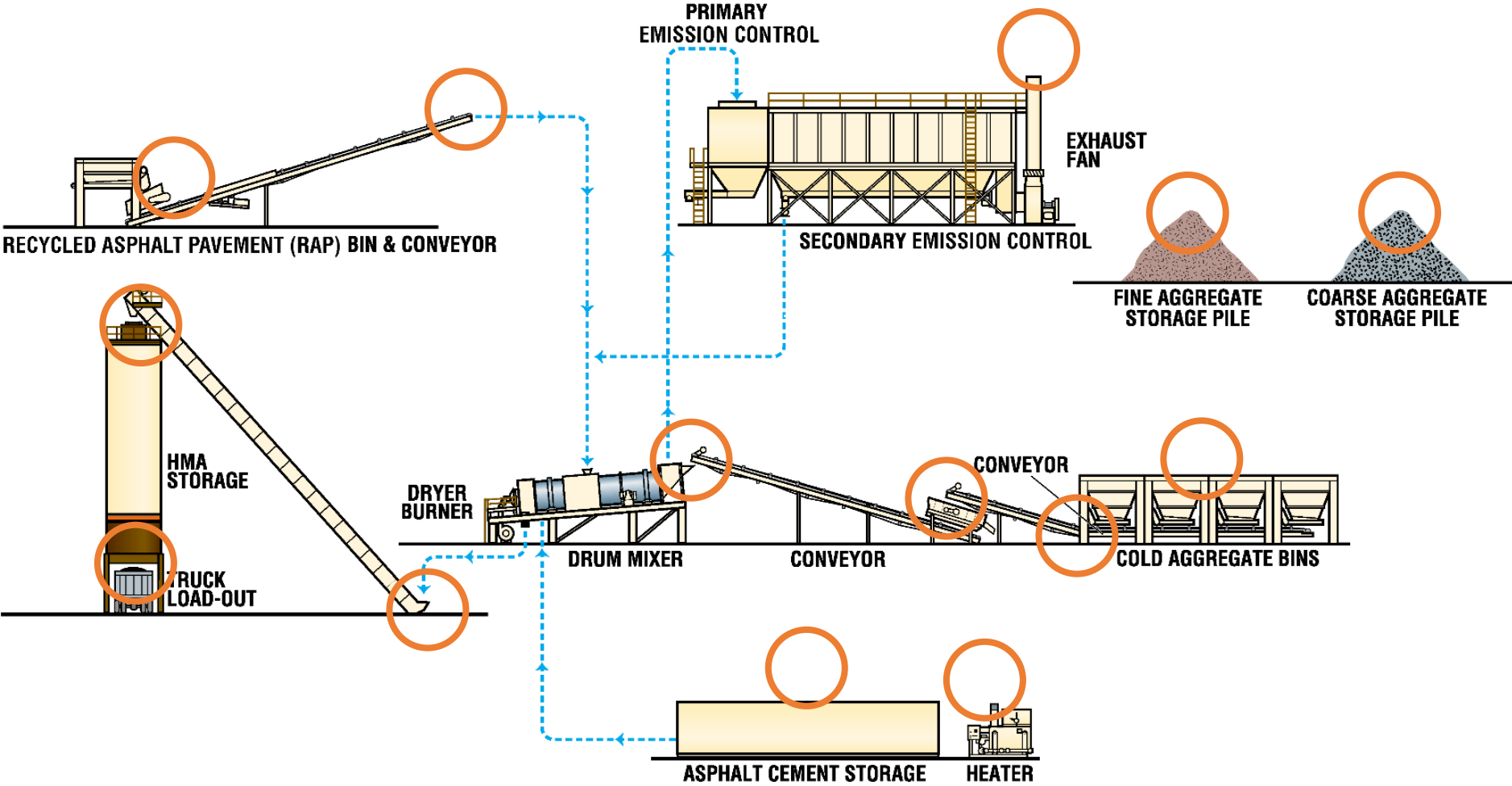
Identify **pollutants** & appropriate **emission factor** for each release point.

Calculate Potential to Emit (PTE) for all pollutants for all release points to get facility-wide PTE.

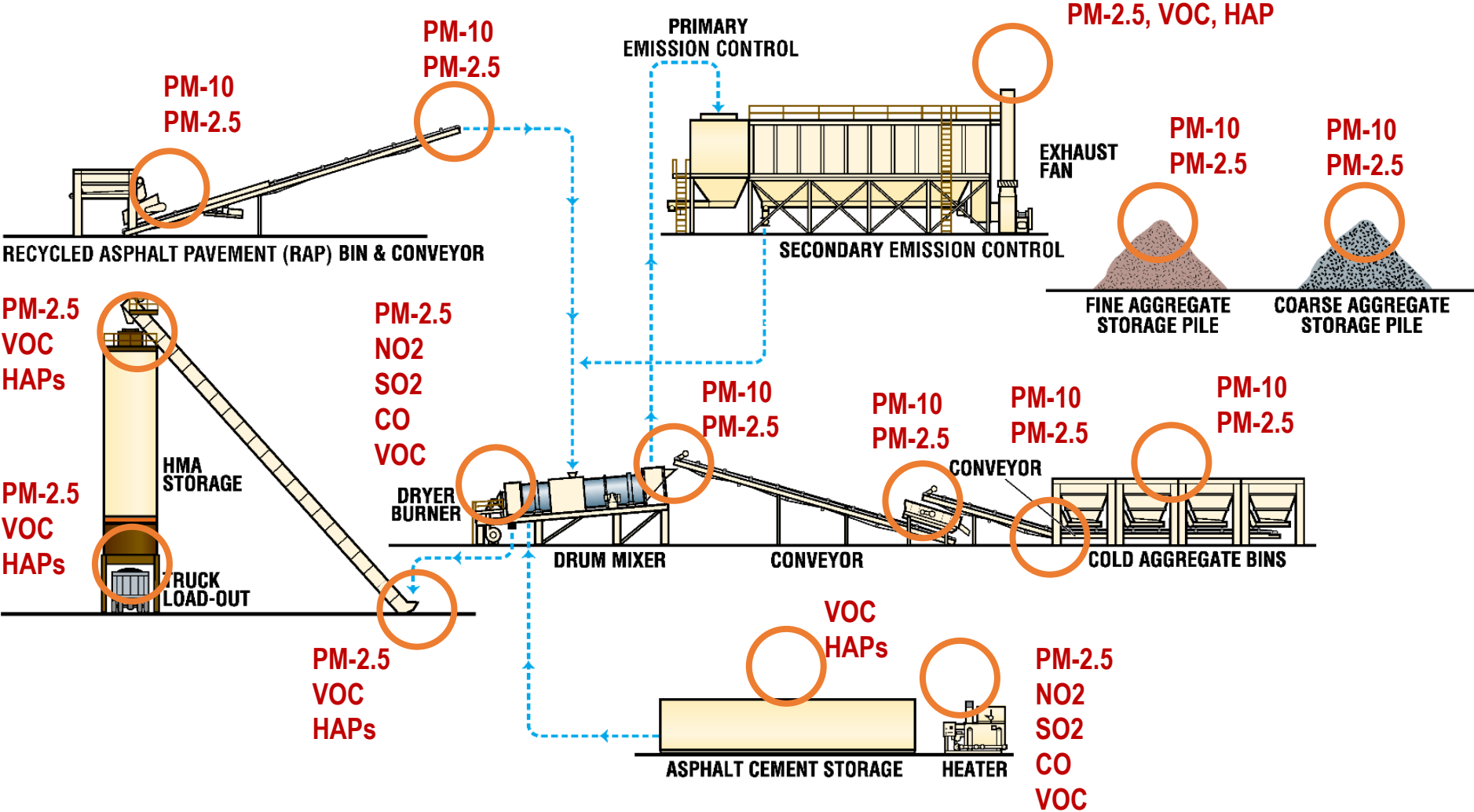
Process Diagram - Asphalt Plant



Identification of Emission Points



Identify Pollutants



Calculate Emissions

Repeat Calculation for all relevant pollutants for each emission point.

Emission Type	From	Equipment	To	Equipment	Amount processed (tons/year)	Amount processed (tons/day)	Amount processed (tons/hour)	% Feed	PM10 Controlled EF (lb/ton)	Annual emissions (lbs/year)	Annual emissions (tons/year)	Daily emissions (lbs/day)	Hourly emissions (lbs/hour)
Wet Processing Plant													
Conveyor Transfer Point - 50% control	--	Front-end Loader	42	Grizzly Feeder	160000	2000	200	80%	5.50E-04	88.00	4.40E-02	1.10	0.110
Conveyor Transfer Point - 50% control	42	Grizzly Feeder	43	Conveyor - Scalping Screen Transfer	128000	2000	200	80%	5.50E-04	70.40	3.52E-02	1.10	0.110
Conveyor Transfer Point	43	Conveyor - Scalping Screen Transfer	44	Conveyor - Scalping Screen Transfer	128000	2000	200	80%	4.60E-05	5.89	2.94E-03	1.10	0.110
...													
Conveyor Transfer Point	49	Conveyor - VSI Crusher Return	47	VSI Crusher	32000	500	50	20%	4.60E-05	1.47	7.36E-04	0.28	0.028
Tertiary Crushing	47	VSI Crusher	46	Conveyor - Blade Mill Transfer	32000	500	50	20%	5.40E-04	17.28	8.64E-03	0.28	0.028
Total Emissions										446.34	0.22	8.80	0.88

Note: For the wet processing plant, equipment S-27 to S-39 and S-50 is excluded from calculations. Since material will be wet, there will be no emissions from these pieces of equipment.

Calc Facility Potential to Emit (PTE) Values for each pollutant.

Calculate Facility PTE

Company Name											
Annual PTE (tons/year)											
System	PM	PM10	PM2.5	SO2	NOx	CO	VOC	Pb	Hg	H2S	HAPs
Total	58.53	24.02	24.02	0.10	1.45	0.31	0.12	0.00	0.00	0.00	0.00

Company Name											
PTE (pounds/hr)											
System	PM	PM10	PM2.5	SO2	NOx	CO	VOC	Pb	Hg	H2S	HAPs
Total	13.75	5.87	5.87	0.38	5.80	1.25	0.47	0.00	0.00	0.00	0.01



Facilities -

Major, Minor or Synthetic Source

- **Major** – single criteria pollutant > 100 TPY or single HAP >10 TPY or multiple HAPs combined >25 TPY.
 - Title V or PSD Federal permit requirements apply.
 - Medium to large industrial facilities.
- **Minor** - Emit < Major source
 - District / state permitting
- **Synthetic** – A source that w/o any restrictions has a PTE of major source BUT has obtained enforceable restrictions to stay below major source.
 - District / state permitting

Importance & Art of Emission Factors

Emissions Factors (EF) are the fundamental tool in developing national, regional, state, and local emissions inventories for air quality management decisions and in developing emissions control strategies.

EF quality varies by type: (select carefully)

- Stack test value from a reference test method
- Manufacturer's rated value
- I/O – mass balance
- AP-42 - EPA compilation of EFs but limited and quality can vary (check EF “grade.”)
- Other District/Agency test of similar unit.
- Control based

Determining Level of Emissions Controls

- District must deny a permit that does not meet AAQS.
- Emissions controls can be used to meet AAQS. Applicant can propose a control technology, but District determines.
- **Some district/state/federal rules require a specific control review process and/or technology for specific process & pollutants:**
 - **BACT** – Best Available Control Technology for criteria pollutants [District/state/federal]
 - **MACT** – Maximum Available Control Technology – like BACT but for toxics/HAPS. [Federal]
 - **TBACT** – District/State toxics Best Available Control Technology [district/state]
 - **LAER** – Lowest Available Emissions Rate: used with offsets, non-attainment. [federal]
 - **ERC** – emissions reduction credit; non-attainment areas [district]

Review Applicable Rule Requirements

(typical examples)

District Rules

- “**De Minimis**” thresholds (non-permit, but still regulated)
- “**Significance**” thresholds (requires BACT, public notice)
- Specific controls & emission limits

Federal Rules

- New Source Performance Standards
- National Emissions Standards for Hazardous Air Pollutants

State Rules

- Air Toxic Control Measures (ATCM)
- Health & Safety Code

Permit Public Notice

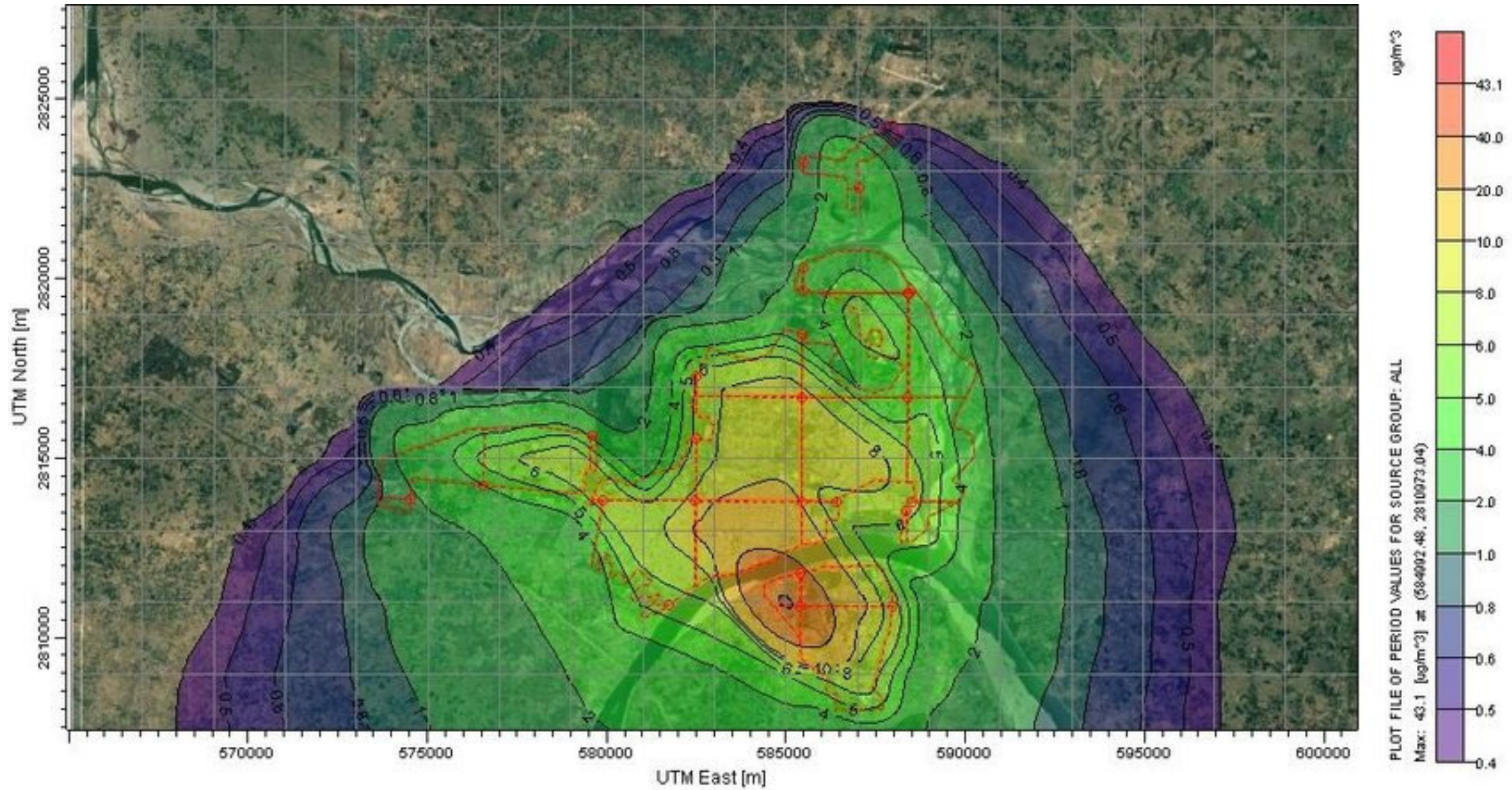
Minor sources that undergo New Source Review and/or meet District significance thresholds in rule.

- Local publication, 30-day public comment, hearing may be held.
- Provide notice to neighboring districts, EPA, & CARB

Major sources (all)

- Email list (EPA does not require PRINTED publication notice).
- Provide notice to neighboring districts, EPA, & CARB
- 30-day comment period
- Public can request a public hearing (not required if not requested)

Closer Look - Air Dispersion Model





Permitting – Geothermal Industry

Unique industry sector and largest dry steam geothermal industrial complex in the world.

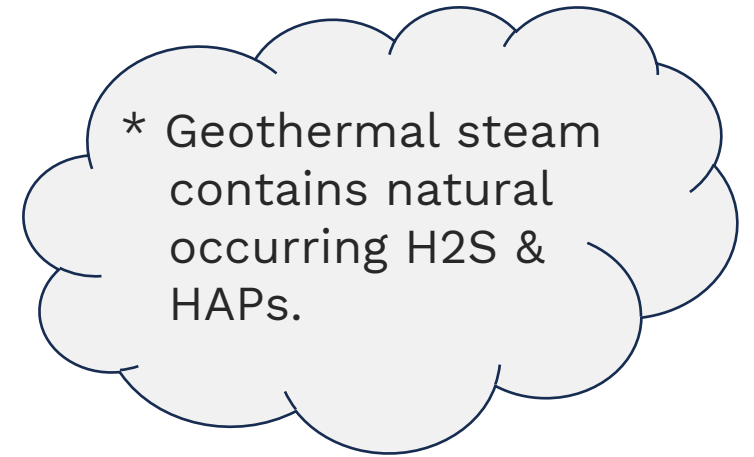
Valuable 24-hour/day clean renewable energy.

District has promulgated a comprehensive set of rules specific to this industry:

**NSCAPD Rule 455 –
Geothermal Emission
Standards.**

Permitting Traditional Geothermal

- **Initial Well Drilling** PM, H₂S, HAPs
- **Well field losses** H₂S
- **Valve/flange losses** H₂S
- **Cooling tower** PM, H₂S, HAPs
- **Stretford Burner** H₂S



- **Unique EFs** derived from steam testing, historic records, stack testing, mass balance.
- **Geyser Area Monitor Program (GAMP)** monitors provides a real time feedback loop of industry performance & efficacy of District permitting & compliance activities.

Permitting New/Novel Geothermal

Current District Geothermal rules apply and provide regulatory coverage.

“Novel” systems tend to be “**closed loop**” to minimize water requirements. In these systems a vertical well bore is drilled to ~8,000 feet and then a horizontal bore and pipe installed or directional fractures in sealed geology to pull water or bi-motive fluid through a hot rock bed. Water converted to steam is captured, condensed and reinjected and sent thru pipe or fractures again to contact hot rock and repeat process.

Fewer emission points than traditional/ existing geothermal projects. **Don't use open cooling towers or Stretford burners.**

New technology may utilize **pentane as working fluid** indirectly heated by geothermal steam. These fluids have lower flash points and are volatile, and a VOC source.



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