



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION VII
726 MINNESOTA AVENUE
KANSAS CITY, KANSAS 66101

March 19, 1986

MEMORANDUM

SUBJECT: Site Specific Study Requirements to Determine Plume Enhancement from Multiple Plumes

TO: Joe Tikvart (MD-14)
Chief, Source Receptor Analysis Branch

FROM: Carl M. Walter *Carl M. Walter*
Chief, Air Branch - Region VII

As we discussed with you earlier, the State of Nebraska submitted a lead SIP revision which contained modeling for the ASARCO lead smelter in Omaha utilizing plume enhancement. We informed Nebraska that we would not accept plume enhancement in the control strategy unless an on-site study was conducted. In discussions with the State of Nebraska, ASARCO, and their meteorological consultant Gale Hoffnagle, we were asked what an on-site study would entail in terms of data collection and evaluation. We had discussed the requirements for such a study briefly before the meeting but did not have the specifics readily at hand. We promised to outline the requirements for such a study in writing so ASARCO can evaluate the costs involved with proving plume enhancement as compared to actual emission control options.

To more clearly understand the dimensions of the groups of stacks in question, I will describe them briefly. All of the stacks are steel, setting on top of baghouses. Each stack serves one compartment of a baghouse. There are two separate baghouses - one termed the smelter baghouse, the other the softener baghouse. The softener baghouse has six stacks, four in a group with identical dimensions termed the south softener baghouse, and two in another group termed the north softener baghouse.

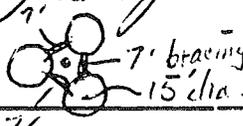
The four stacks are 1.21 meters in diameter, 25.3 meters above ground at the top, and spaced 3.47 meters apart. The two stacks on the north softener baghouse are 1.83 meters in diameter, 25.3 meters above ground at the top, and are 6.25 meters apart. No enhancement credit was claimed for intergroup buoyancy. The separation between the last stack in the group of four and the nearest stack in the group of two is 7.54 meters.

The smelter baghouse is located across the plant site from the softener baghouse. The two stacks on this baghouse are 1.52 meters in diameter, 23.2 meters above ground at the top, and are 9.29 meters apart. All groups of stacks are generally oriented north-south, which is the prevailing wind directions at the plant.

We think that the following requirements should be specified to compare observed and calculated plume rise at ASARCO Omaha.

1. Measure the exit temperature and exit speed for all stacks. This information would verify data which is already available.
2. The six softener baghouse stacks have raincaps. These would have to be removed before conducting any tests.
3. On-site wind speed and direction would be collected at three heights: ten meters, top of stacks, and expected final plume height. This could be done with a tower of sufficient height, a dopler lidar if the tower could not be built to a sufficient height, or by a tethered sonde. Data collection would be continuous with at least 90 percent data recovery.
4. On-site ambient temperature would be measured.
5. By the use of a tracer or additives, the plumes from the stacks would be made visible. Ground based and aerial photographs, or videos would then be used to record plume movement. Vertical plume movement could also be documented with the use of ground or air lidar, but this could not be substituted for photographic documentation.
6. Acoustic soundings would be required for on-site mixing height determination.
7. The plant would have to be operated at typical operating rates.
8. Even though observations should be made for all wind directions, atmospheric stabilities, and seasons, because of time constraints, the study cannot be conducted for a one-year period. Because the third quarter meteorological conditions have historically resulted in highest predicted lead levels at the plant, the data would have to be collected in the period July to September 1986.
9. A detailed study plan would be developed by ASARCO and approved by EPA before the study commenced.

We would appreciate your comments or additions to the items we have listed above. Additional items could be added as part of developing the study plan, but we want to cover at least the major items which would require expenditure of resources. We will discuss this memorandum by phone.

RECORD OF COMMUNICATION		<input checked="" type="checkbox"/> PHONE CALL <input type="checkbox"/> DISCUSSION <input type="checkbox"/> FIELD TRIP <input type="checkbox"/> CONFERENCE <input type="checkbox"/> OTHER (SPECIFY)	
		(Record of item checked above)	
TO:	Jim Dicke		FROM: Bob Kelly / Anna Maria Coleenka
			DATE: August 22 1990 TIME: 11:40a
SUBJECT Merged plumes from separated stacks			
SUMMARY OF COMMUNICATION <p>A source in NJ questioned the State and ROD about whether 3 stacks not in a common enclosure but connected together could be modeled as one stack with merged flows for plume rise calculations. There are 3 stacks, each 15' diameter in set as a triangle and separated by 7'. The stacks are connected by bracing for support to avoid swaying, etc. The height is unknown but less than 65 m according to the GEP Guideline since the separation distance is less than L - assumed to be 15' - the "gap" can be considered closed and the 3 stacks a continuous source. Thus we concluded that if the flow rates and temperatures were ^{always} the same for all 3 stacks, the plumes could be merged. However, if the source planned to vary the flows and temps among the stacks by process, work shift or other means, then each stack should be modeled separately, i.e. no merging.</p>			
CONCLUSIONS, ACTION TAKEN OR REQUIRED <p>Anna Maria originated the call but was out when I returned, and Bob knew the circumstances. They will work together and either one will relay the position to NJ who I believe is against merging plumes.</p> 			
INFORMATION COPIES TO: Dean			