

## 2.5 Other Copper Features

Copper is used for spires, cupolas, doors, lights, signs, railings, weather vanes and other exterior ornamental features (photo), concrete inserts, water stops, and garden edging strips. Copper releases from these small features are believed to be less significant than that from complete roofs made of copper.

These features appear in perhaps 1% of all structures in the RWQCP service area.



## 3. Wood Preservatives

### 3.1 Factory-Preserved Lumber

Wood preservation products are discussed in an earlier RWQCP technical memorandum by Bill Johnson of EIP Associates.<sup>[6]</sup> These products often are formulated with either copper arsenate (CCA) or copper quaternary ammonium chloride (ACQ). Factory-preserved wood is pressure treated with one of these compounds, dried, and then shipped to lumber suppliers.<sup>[9]</sup>

Factory-preserved lumber is specified by building codes for situations where moisture contact is expected, such as wood foundation sills and exterior decks. Foundation lumber used to construct the typical 2,500 square foot home on a flat lot will require about 3 gallons of factory-applied preservative. Since this product has 0.67 lbs of copper per gallon, the preserved lumber is estimated to contain 2 lbs of copper.

### 3.2 Wood Preservatives Used During Construction

Exposed areas are created when preserved lumber is sawn or drilled during installation. These areas can be treated at the job site with new preservative that is brushed, wiped, or sprayed onto the wood. Construction of a new 2,500

square feet home may consume about 1/2 gallon of preservative if the contractor takes care to fully reseal the exposed lumber. This preservative contains 0.33 lbs of copper.

### **3.3 Factory-Preserved Wood Shingles**

Copper arsenate is mentioned in the literature as a preservative used in wood shingles made of pine.<sup>[7]</sup> Conversations with local roofing suppliers suggests that redwood and cedar shingles are more commonly used in the Bay Area. These two woods do not typically need a preservative, although fire retardant chemicals that sometimes include preservatives are required by code. It is recommended that samples of these shingles be tested for copper content.

## **4. Release of Copper To The Environment**

This section of the report presents an order-of-magnitude estimate of the amounts of copper that rainfall will release from roofs, gutters, downspouts, and other architectural features in the Palo Alto RWQCP service area. The estimate is in five parts:

1. Local Rainfall Data
2. Background Copper (Wet & Dry Deposition)
3. Copper from Individual Building Features
4. Copper from Representative Buildings
5. Total Amount of Copper Released in the Service Area

Monitoring data from various researchers contribute to the estimates of copper deposited from the atmosphere and also released by corrosion of individual features. However, the extent to which these building features are actually used in the RWQCP service area is not yet known. Therefore, the overall estimate of total copper released in the service area is only approximate.

### **4.1 Local Rainfall Data**

The State of California publishes real-time internet weather data for a number of observation points throughout the San Francisco area, including one located at the Palo Alto Airport. Rainfall amounts and intensities reported at this site for the 1999 - 2000 winter are summarized in Exhibit 4.<sup>[32]</sup>