

Recent Happenings in the Management of the Carson River Mercury Site

Carson River Watershed Forum

April 3, 2014



Carson River Mercury Site and Operating Units

The primary strategy used by EPA and NDEP on the CRMS is long term management of the contamination issues on the site, as true clean-up is not possible. The site is divided into two management units.

Operating Unit 1 (OU-1)- The upland mercury-contaminated mills, tailings and soils, i.e., Silver City, Gold Hill, Virginia City, Morgan Mill and floodplain through Brunswick Canyon, Dayton floodplain, Six-Mile and Seven-Mile Canyon and the Six-Mile Canyon alluvial fan.

Operating Unit 2 (OU-2)- The Carson River system where impacted by mercury contamination, i.e., the river beginning at approximately Morgan Mill in Carson City through the Lahontan Reservoir and down to its termination in the Stillwater wetland and Carson Sink. Also Big and Little Washoe Lakes.



Superfund and Five-Year Review

The Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) is Superfund.

CERCLA requires a review of the remedy **no less than every 5 years.**

- **First 5 year review 2003-** Found remedy to be adequate.
- **Second 5 year review 2008-** Found remedy lacking in several areas.
- **Third 5 year review 2013-** Recognized changes/corrections made in management of the site and found remedy adequate.



Superfund and Five-Year Review

Negative Findings in the Second Five-Year Review

- Site boundaries not well defined.
- Long Term Sampling and Response Plan (LTSRP) does not address small residential developments.
- LTSRP is a draft document.
- Information on institutional controls (ICs) for properties not readily accessible.
- No ICs for properties cleaned-up by the EPA in 1997-98 and no follow-up inspections of those remedial actions.



Updates to Operating Unit 1

Most of the EPA-sponsored investigation of OU-1 has already been done. Subsequent investigation and clean-up, if necessary, will occur through the continued sampling and analyses that occurs due to new development.

The Record of Decision (RoD) created the Long Term Sampling and Response Plan (LTSRP) as one institutional control by which such management is to be attained.

- A draft LTSRP was written in 2005
- Through implementation the EPA and NDEP have identified issues and shortcomings in the draft.
- The final LTSRP is planned to be rolled-out this year and primary access to the document will be via the internet.



Updates to Operating Unit 1

Future investigation of OU-1 will likely be limited to sampling due to soil disturbance for new home construction and other commercial development or mining extraction activities.

EPA and NDEP's additional investigation of contamination at historic mill sites.

- An initial archaeological review of these sites was completed in 2013.
- Any intrusive work planned for these sites will progress slowly because of strict adherence to National Historic Preservation Act considerations.



Updates to Operating Unit 1

Finding of 2008 Review that there was insufficient investigation of smaller residential development.

New LTSRP adds the investigation of residential properties performed by NDEP as requested by property owners or due to new soil disturbance on their property greater than 3 cubic yards.



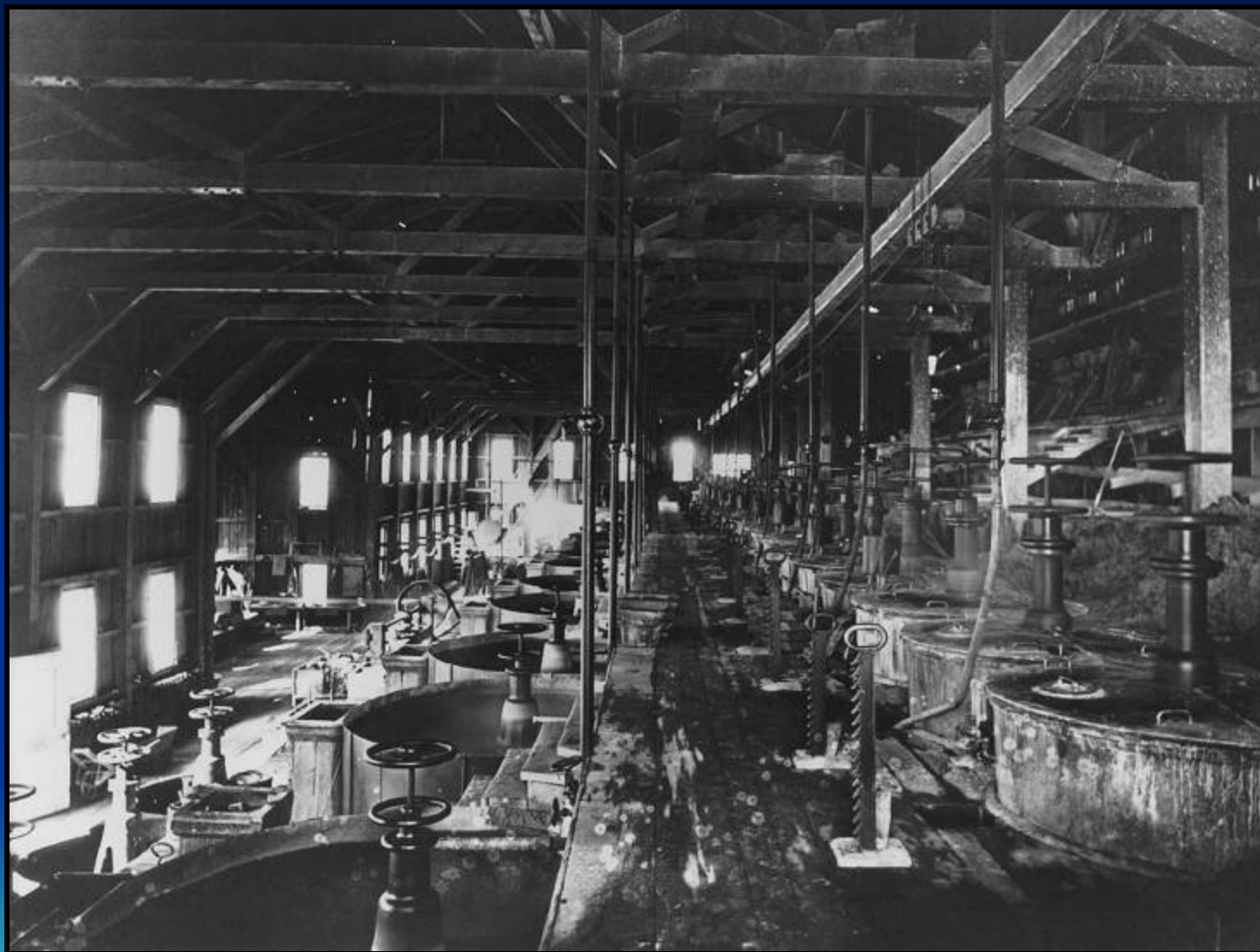
Third Five-Year Review 2013

The findings of the third five-year review completed in 2013 recognized all actions taken or in progress by EPA and NDEP in response to the 2008 review findings and accepted them as being sufficient.

The finding of the 2013 review is that the remedy is protective of human health and the environment.



Mercury Amalgamation Pans in the Brunswick Mill



Tail-race of Brunswick Mill On The Carson River



Explanation of Significant Differences

The RoD is a legal document issued by authority of EPA.

- Major changes require an amendment of the RoD.
- Amendment requires much the same legal process as the original.
- For minor variations or changes that do not alter the findings of the RoD, an Explanation of Significant Differences (ESD) can be adopted by EPA and any other signatories (NDEP) to the RoD.

An ESD was adopted on the CRMS in 2013 to address two issues:

- Redefinition of Site Boundaries;
- New Action Levels for Arsenic and Lead.



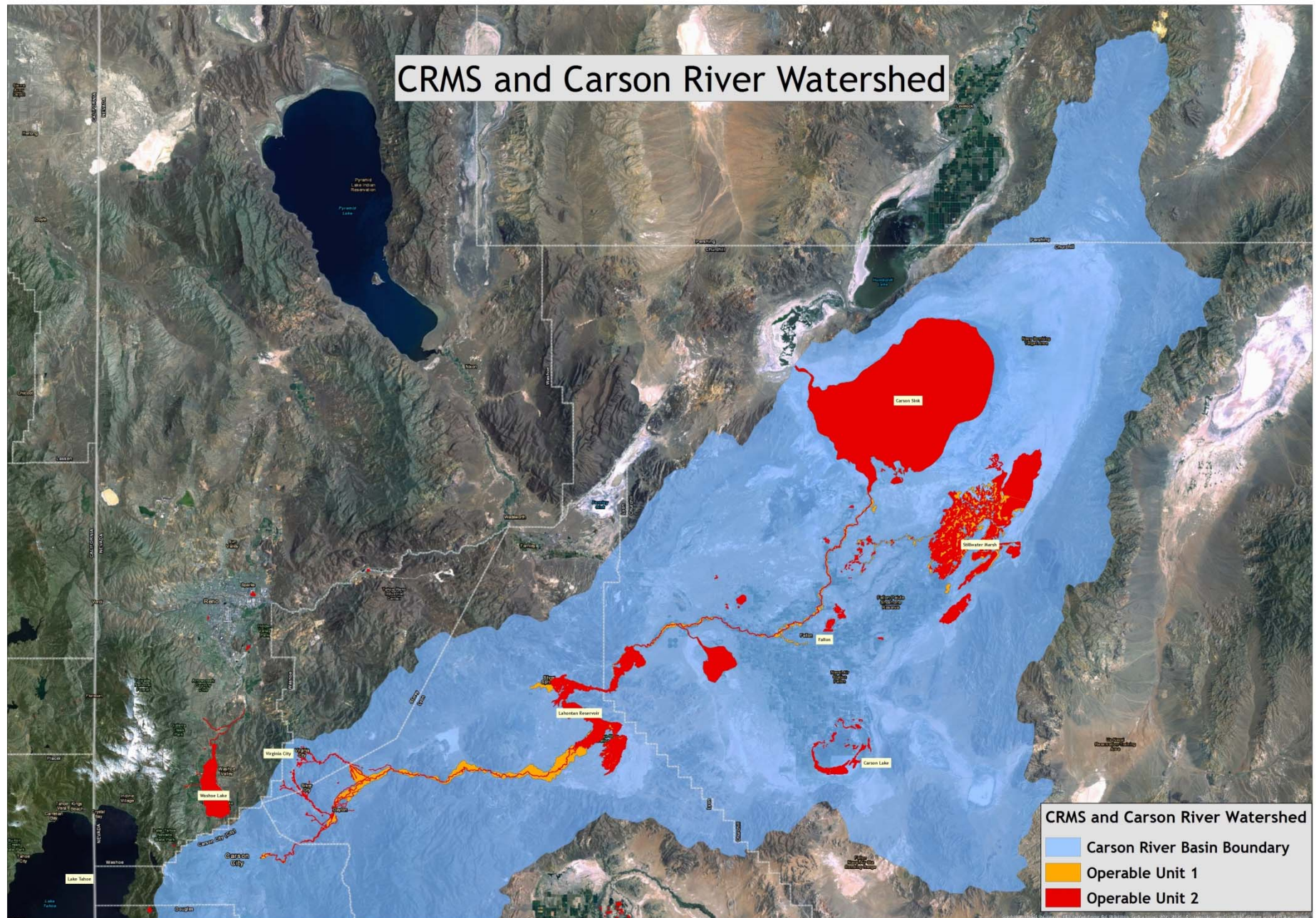
ESD- Revision of Site Boundaries

The original definition of the CRMS included a definition that captured the entire drainage basin from the Morgan Mill area in Carson City to its terminus in the Carson Sink and the Stillwater Wildlife Refuge and the drainages captured by Big and Little Washoe Lakes.

In 2009, NDEP utilized historic maps of mills that operated in the Comstock era using the mercury amalgamation process and included the drainages that flowed from these sites to re-draw the site boundaries and greatly reduce the size of the CRMS footprint.



CRMS and Carson River Watershed



ESD- Revision of Site Boundaries

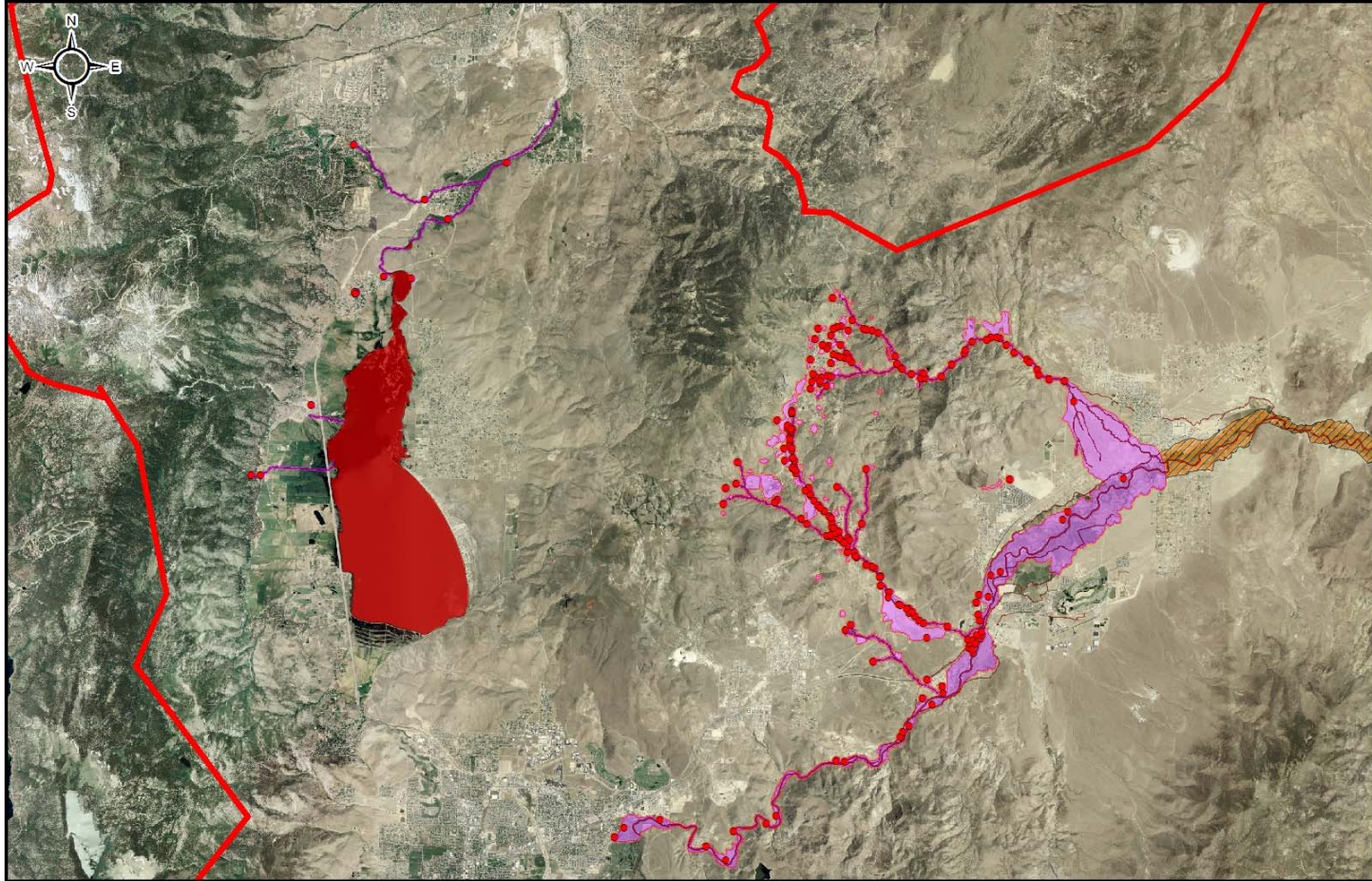
NDEP needed to create buffers around the most likely sources of mercury contamination to make a conservative estimate of the maximal extent of contamination.

These buffers were ranked as low and moderate risk areas depending on the offset distance from boundary of the likely impacted area. The likely impacted areas were ranked as high risk.

- These risk zones have been identified in the final LTSRP.
- Sampling programs are modified dependent on whether one is working in low, moderate or high risk zone.
- Risk zones have been incorporated into the new CRMS boundaries.
- These are dynamic definitions with the intention of eliminating or narrowing them as data specific to these areas is collected.



CRMS Map Showing Risk Zones



Establishment of Soil Action Levels for Mercury

The Human Health Risk Assessment performed for the CRMS established an action level for mercury contamination.

- This number is based on conditions and occurrences of contamination observed and measured in the field.
- These conditions were used to formulate a risk model for potential exposure to mercury in the CRMS.
- The risk assessment determined the risk to be mitigated is the incidental ingestion of mercury-contaminated soil by children 6 years old or younger playing in their yards. The concentration of mercury requiring clean-up in the CRMS became 80 parts per million in a residential yard.



ESD- Revision of Soil Action Levels for Arsenic and Lead

Arsenic and lead were also identified as contaminants of concern on the site.

- Site-specific risk action levels were not established for these two metals on the CRMS.
- Nevada clean-up and exposure standards for these metals have changed and the ESD allowed new actions levels to be adopted for the CRMS.
- Nevada now utilizes the EPA Region 9 Regional Screening Levels (RSL) to determine appropriate action levels for clean-up of arsenic and lead, as well as for many other contaminants.



ESD- Revision of Soil Action Levels for Lead

For lead, the Region 9 RSL is 400 parts per million in residential soil and this concentration has been adopted as the action level for lead in residential soil in the CRMS through the ESD.



ESD- Revision of Soil Action Levels for Arsenic

The EPA Region 9 RSL for arsenic tends to be much lower than naturally-occurring arsenic levels found in Nevada soil.

- Neither the EPA or NDEP require clean-ups below naturally-occurring background levels.
- NDEP used a 1991 USGS study of the geochemical composition of soils from many locations sampled in the CRMS region.
- Through statistical analysis of the USGS results, an action level value for arsenic levels in the soil on the CRMS was established as 32 ppm.



Contacts and Resources

NDEP Superfund Branch

Supervisor- Jeff Collins (775) 687-9381

Staff- David Friedman (775) 687-9385

