Independent Oversight Follow-up Review of the Hanford Site Chronic Beryllium Disease Prevention Program

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Acronyms

BCA	Beryllium Controlled Area
BeCAP	Beryllium Corrective Action Program
BHA	Beryllium Hazard Assessment
BRA	Beryllium Regulated Area
BSA	Beryllium Suspect Area
BWP	Beryllium Work Permit
CBDPP	Chronic Beryllium Disease Prevention Program
CFR	Code of Federal Regulations
CHPRC	CH2M-Hill Plateau Remediation Company
DOE	U.S. Department of Energy
ERDF	Environmental Restoration Disposal Facility
ES&H	Environment, Safety, and Health
HAMMER	Hanford Site Training Complex
HASP	Health and Safety Plan
HSS	Office of Health, Safety and Security
HSWET	Hanford Site Worker Eligibility Tool
IH	Industrial Hygienist
IHT	Industrial Hygiene Technician
MSA	Hanford Mission Support Alliance
OFI	Opportunity for Improvement
ORP	Office of River Protection
PFP	Plutonium Finishing Plant
PPE	Personal Protective Equipment
RL	Richland Operations Office
WCH	Washington Closure Hanford
WRPS	Washington River Protection Solutions

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1.0 PURPOSE

The U.S. Department of Energy (DOE) Office of Enforcement and Oversight (Independent Oversight), within the Office of Health, Safety and Security (HSS), performed a follow-up review of corrective actions taken to improve the Hanford Site chronic beryllium disease prevention program (CBDPP). The purpose of the review was to provide the Richland Operations Office (RL), the Office of River Protection (ORP), and site contractor management with an assessment of the effectiveness of the implementation of key corrective actions taken in response to the 2010 HSS inspection of the Hanford Site CBDPP and to provide site management with opportunities for improvement (OFIs).

2.0 BACKGROUND

Independent Oversight conducted an inspection of the Hanford Site CBDPP in April and May 2010 at the request of the Assistant Secretary for Environmental Management. The 2010 Independent Oversight inspection identified a number of deficiencies in the content and implementation of the CBDPP, resulting in 4 findings, 14 cross-cutting OFIs, and numerous specific OFIs. In response to the 2010 Independent Oversight inspection report, Hanford Site management developed a detailed corrective action program and schedules to address these identified deficiencies through the development and implementation of 74 beryllium corrective action program (BeCAP) products.

In April 2011 (report dated June 2011), Independent Oversight performed a follow-up review of the status of corrective actions taken by the contractor in response to the 2010 inspection report. Independent Oversight determined that interim actions had been taken and that organizations demonstrated commitment to improving the program. However, various aspects of the corrective action plan warranted improvement, and concerns about the timeliness of corrective action implementation were identified.

As of October 2012, a number of beryllium products had been reported as completed, but the only beryllium products reported as being implemented in the field were various interim actions as defined by RL, ORP, and the beryllium work permit (BWP). Therefore, for this follow-up review, Independent Oversight focused on the effectiveness of the BWP process and the associated beryllium hazard assessment (BHA), as well as reviewing the training for building assessments and hazard characterization (a completed beryllium product) that was piloted during the week of this onsite review.

3.0 SCOPE

The onsite portion of the follow-up review was performed November 26-30, 2012, by a team of Independent Oversight personnel, as listed in Appendix A. The follow-up review scope is described in the HSS Office of Safety and Emergency Management Evaluations *Plan for the Independent Oversight Follow-up Review of the Hanford Site Chronic Beryllium Disease Prevention Program Corrective Actions*, dated November 2012, which states that "the review will focus on the implementation of the site BWP process and pilot training on building assessments." During the onsite data-gathering portion of this review, the Independent Oversight team met with managers, technical staff, and workers; reviewed records and documents, including completed BWPs and BHAs; and observed beryllium team meetings (e.g., a BeCAP Core Committee meeting), training, and work activities to assess the effectiveness of the

implementation of the BWP process and ongoing beryllium training. The Independent Oversight team also met with selected Hanford Site stakeholders to gather their perspectives.

The Independent Oversight team focused on assessing the effectiveness of implementation of the BWP program by four Hanford Site contractors –Mission Support Alliance (MSA), CH2M-Hill Plateau Remediation Company (CHPRC), Washington Closure Hanford (WCH), and Washington River Protection Solutions (WRPS) – as well as the beryllium training provided at the Hanford Site Training Complex, also known as the HAMMER Training Facility.

4.0 RESULTS

While a number of actions have been completed, much work remains to complete and implement the various processes and products associated with the BeCAP. These include the processes and training for several key items, including building assessment and characterization processes and posting. Pilot training for these processes was conducted during the onsite review period.

4.1 Overview of the Implementation Status of the BWP Process

The BWP and accompanying BHA process was implemented at the time of the review. The BWP procedure (Procedure #DOE-0342-001) describes the BWP and BHA process; it was published on June 12, 2012, and became effective on July 30, 2012. Prior to implementation (between March 2012 and July 2012), workers, managers, industrial hygienists (IHs), and industrial hygiene technicians (IHTs) received training on the BWP/BHA process. Workers who had received beryllium worker training before the BWP procedure was issued received supplemental gap training on the BWP process. All four primary Hanford Site contractors are currently implementing this process.

4.2 Assessment of the BWP Process

Section 6.7 of the Hanford Site CBDPP procedure (Procedure #DOE-0342) describes the job-specific BWP and requires the issuance of a BWP for all work conducted in a beryllium controlled area (BCA) or a beryllium regulated area (BRA). In order to complete a BWP, a BHA must first be performed. BHAs describe the work activity and location, hazards present, hazard controls, and both current and historical industrial hygiene beryllium sampling data. BHAs require a site condition walkdown, are job-specific, and correlate directly with a job-specific BWP. The BWP is completed using the information from the BHA, details the entry requirements for a BCA or a BRA, and provides specific beryllium control information, such as area posting, access controls, engineering controls, respiratory protection, protective clothing, air and surface sampling, and IH coverage requirements.

The BWP program and process for implementation are described in the *Hanford Site Beryllium Work Permit (BWP) and Hazard Assessment Procedure (DOE-0342-001)* and the Hanford Site CBDPP. This procedure establishes how to prepare and use the BWP and the BHA form. The procedure applies to Hanford contractors who are responsible for facilities where beryllium activities may have been conducted and to any current activities that involve actual or potential exposure to beryllium.

Overall, the BWP procedure is logical and detailed, and it provides sufficient instruction for an individual to complete either the BWP or BHA form. However, the Independent Oversight team identified several areas for continued improvement with respect to the procedure.

Since the BWP/BHA procedure was published in June 2012, a number of questions have arisen concerning its implementation. To address these questions, a process (called the Process to Transition

BeCAP Products from the BeCAP Core Committee to the CBDPP Committee) was established to raise issues and concerns about the CBDPP and associated procedures (e.g., the BWP/BHA procedure) that may require a document change or a clarification of intent. The product transition process requires that issues/concerns identified during run time be transmitted to the RL Be CAP Representative, who will forward the issue/concern on to the product team lead to prepare a response. The response could include preparation of a CBDPP resolution form if necessary to address the issue/concern. The transition process does not specifically address how members of the workforce raise the concern. However, typically the members of the workforce raise concerns through the normal avenues with which they are familiar (e.g., project IH staff, union safety representatives, CBDPP Company Sub-Committee), who have been informed to transmit the issues/concerns on to the contractor or HAMTC Be CAP lead who will forward them on to the RL Be CAP Representative to initiate the process described above.

To date, eight such CBDPP resolution forms on the BWP procedure have been completed and approved by the CBDPP Committee, five initiated by the BWP/BHA Product Team Chairperson and the other three by the CBDPP Committee Chair. Once a resolution is identified and the form is signed by the CBDPP Committee Chair and DOE, the resolution goes into effect and is binding.

The resolution form is a useful concept for identifying and resolving issues with the BWP procedure during the initial phase of implementation. However, the resolution process is a work in progress and is cumbersome to implement. The Independent Oversight team identified two specific concerns:

- A number of the older resolution forms provide for an indication of whether the proposed resolution is for "clarification" or "guidance," but three of the eight forms reviewed provide no such indication. Furthermore, it is not clear whether a resolution that results in "guidance" implies "must follow" or something else. In the more recent resolution forms, "guidance" was changed to "document change" to make the intent clearer.

- Resolution forms are cumbersome for the BWP preparer to use, and there is no limit on the number of resolution forms that can be issued before the procedure is revised to incorporate the changes from the various forms into one document. Currently there are eight resolution forms associated with the BWP procedure. Since there is no "master BWP markup procedure" for incorporating all of the changes specified on the resolution forms, it is incumbent upon each procedure user to read, decipher, and follow all the applicable resolution forms that have resulted in a procedure change. It is also challenging for the procedure users to ensure that they have located all the applicable resolution forms, although this process is being simplified by posting the completed resolution forms on the CBDPP web site. (See **OFI-1** in Section 6.)

Since the BWP procedure is intertwined with other beryllium procedures that have not yet been issued, some elements of the BWP procedure may be impossible to follow or may remain insufficiently defined until the remaining procedures are complete and workers have been trained. For example, the second paragraph on page 6 of the BWP procedure states that "a BWP is not required inside a Beryllium Suspect Area (BSA) …." However, the term "BSA" is new to the beryllium program and has not yet been defined in the CBDPP or any other issued procedure. The BSA term is addressed in recently developed draft procedures, but such procedures are not yet issued, and workers have yet to be trained on their meaning and use. Furthermore, the signage for these new areas has not been distributed to the contractors. This concern was recognized by the BeCAP team. (See **OFI-2** in Section 6.)

Section 2.0, "Location Description," of the BHA form requires the preparer to list sample data obtained during the building characterization process. The preparer is to provide information on bulk samples, wipe samples, and air samples with respect to total number of samples, minimum and maximum concentrations, and average concentration. Although the Independent Oversight team concurs that most

of this information is useful in conveying to the worker whether and how the area was sampled and the bounds of the measurements, it is not clear whether the reporting of an "average" value is useful or (based on reviews of completed forms) consistently correct. For example, the laboratory performing the analysis of beryllium samples reports much of the sampling data as "less than the quantification limit," indicated by a number preceded by "<." There is no consistent practice at Hanford for the treatment of such numbers in the context of a string of numbers, some of which are positive and others are reported as "<." Based on interviews, some IHs and IHTs routinely exclude all such "<" numbers when computing an average. Others factor in the "<" values when calculating averages; for example, reporting < 0.005 as 0.005. Other options have been to divide the value by 2, or the square root of 2, or something else. For example, for a string of four surface wipe sample results (e.g., 0.025 μg/100 cm^2, 0.095 μg/100 cm^2, <0.005 μg/100 cm^2, and <0.002 μg/100 cm^2), the computed average values can be considerably different, depending on whether and how the "<" values are considered. Furthermore, if one value in a string of sample results is above a trigger level (e.g., 0.1 μg/100 cm^2 for surface samples), the CBDPP requires an investigation, and if one value is above an action level (e.g., 0.2 μg/100 cm^2 for surface samples), the CBDPP requires posting as a BCA and implementation of controls, such as a BWP. In the aforementioned example of four surface wipe samples, it would appear that the CBDPP requires neither an investigation nor posting because none of the sample values exceeds 0.1 μg/100 cm^2. However, if the calculation were to discount the two "<" values and compute the 95^{th} percentile using the remaining two numbers and Bayesian statistics, the result would be different – i.e., that "there is an 85% probability that the surface contamination levels will exceed the trigger level of 0.1 μg/100 cm^2 and a 51% probability that surface contamination levels will exceed 0.2 μg/100 cm^2." Therefore, an investigation, more sampling, or posting the area would be a reasonable course of action. (See **OFI-3** in Section 6.)

4.3 Assessment of CBDPP Training

Although BWP training was not conducted during the week of the team's onsite review, the initial pilot course on Beryllium Postings, Assessment and Characterization/Verification was scheduled and attended by members of the Independent Oversight team. According to the instructors, this pilot course was offered in a similar format to the initial BWP training course and consisted of a block of instruction followed by a critique. In addition to the students, the pilot training included a number of observers representing the workforce, the Hanford Atomic Metal Trades Council, the Beryllium Awareness Group, and DOE who participated in the critique. Overall, the Independent Oversight team concluded that the initial training process was thorough and well organized, and it provided opportunities for feedback from various segments of the workforce that would result in improvements to both the context and style of presentation.

Supplemental training on the BWP and BHA process is provided through a number of structured training courses. For example, all site workers receive beryllium awareness training during Hanford General Employee Training (HGET), which includes a brief presentation on the BWP. Beryllium awareness training is also provided as part of HGET refresher training. A number of courses offered through the HAMMER Training Facility also provide supplemental information on the use of the BWP, including the four-hour training course for Beryllium Workers, the Beryllium Outside Trainer Course, and the new pilot course on Beryllium Postings, Assessment and Characterization/Verification. Additional "gap" training was provided to beryllium workers who attended the Beryllium Worker training course before issuance of the BWP procedure to inform them of the new BWP procedure requirements.

The principal training course for workers responsible for preparing, reviewing, and approving BWPs is the Hanford Site BWP and BHA course. This four-hour classroom course has been provided to over 130 IHs, IHTs, supervisors, and managers. The Independent Oversight team reviewed the lesson plan for this course and found the content to be instructive and consistent with the requirements of the BWP procedure. However, based on interviews, it was not clear whether successful completion of this course

was a requirement for preparing, reviewing, and/or approving BWPs. At least one contractor indicated that taking the course was a prudent measure but not required to prepare or approve BWPs. The training staff at the HAMMER Training Facility disagreed and indicated that completion of the course was a prerequisite for reviewing and approving BWPs. Section 3.0 of the BWP procedure, entitled "Training Requirements," lacks clarity on this issue. The BWP procedure states that "employees performing the actions of this Procedure must be appropriately trained to fulfill the requirements of this Procedure" and that "an employee's level of training shall be adequate to comply with the requirements described within this procedure based on the employee's level of participation." (See **OFI-4** in Section 6.)

4.4. BeCAP Process Implementation Oversight

One of the key concerns from the June 2010 inspection was that insufficient RL and ORP oversight contributed to unnecessary delays in implementing the site wide CBDPP, recurrence of past deficiencies, and poor communications. While RL, ORP and EM have focused attention on the development of products, with implementation of the BWP process and several additional processes nearing completion, oversight of early implementation will be essential to ensuring overall success in establishing an effective site wide CBDPP. Representatives of RL and ORP stated that although effectiveness reviews of BeCAP actions will be performed at a later date (to be determined), subject matter experts, Facility Representatives, and the remaining Independent Beryllium Oversight Team member have been trained in processes, including the BWP, to facilitate their oversight of early implementation. These individuals have been directed to conduct oversight and/or Operational Awareness Database (OADB) entries to determine whether such processes as the BWP are implemented correctly and consistently. At the time of the review, this information had not been collated or reviewed to provide an early assessment of implementation of the BWP process. Additionally, an early assessment of performance using a combination of contractor assessments, RL and ORP assessments, and/or the data collected from these oversight/OADB entries will be essential in getting an early read on the adequacy or implementation and support recommendations to transition products from the BeCAP Core Committee to the CBDPP Committee and disbanding product teams. This early feedback will be essential in ensuring that the processes and training have resulted in accurate communication and understanding of the BWP and other new CBDPP processes. (See **OFI-5** in Section 6.0.)

4.5 Implementation of the BWP by Mission Support Alliance

MSA is responsible for approximately 240 buildings and/or structures throughout the Hanford reservation. However, MSA employees are stationed at or assigned to only a small number of those facilities. Currently, MSA does not have any BCAs or BRAs within its facilities and thus has not needed to develop a BWP or perform a BHA. Although MSA has a substantial workforce (nearly 1700 employees, 300 of whom are beryllium workers), MSA workers typically support or supplement other site contractors with iron workers, electricians, fitters, millwrights, carpenters, and sheet metal workers through a loaned labor pool. In this capacity, MSA workers perform work under BWPs issued and maintained by the host contractor (i.e., CHPRC, WCH, or WRPS). MSA also has work groups that maintain the site service contract and perform work under MSA work procedures (e.g., Vent & Balance Group), but if this work involves BCAs or BRAs, the facility owner is responsible for preparing the BHA and BWP. If a BWP prepared by the facility owner does not address the hazards of the work being performed by the MSA worker, it is incumbent on the MSA worker to inform the facility owner of any inaccuracies that could impact the BWP for the work area. Although the Independent Oversight team perceived a potential vulnerability with respect to communication of the MSA work scope, hazards, and hazard controls when working in BCAs under the responsibility of other contractors, no such issues with regard to the BWP or BHA were identified on this follow-up review.

4.6 Implementation of the BWP by Washington River Protection Solutions

WRPS has completed an initial facility characterization of 47 buildings and facilities within its work scope, resulting in ten buildings being classified as beryllium controlled facilities, each of which has one or more BCAs. Initial facility assessments were also completed in accordance with the previous version of the CBDPP. To date, WRPS work activities in BCAs have been limited to two buildings: the pump and evaporator rooms in Building 242A, and a limited area within Building 272WA for annual opening and closing of fire riser valves for testing. During this 2012 follow-up review, WRPS workers did not enter BCAs or BRAs.

For Building 242A, one BHA was prepared for two BWPs, one covering entries to the evaporator and pump rooms to perform housekeeping/cleaning of the facility and facility components, and the other covering entries to the same locations to conduct beryllium sampling in support of facility characterization. Both the BHA and the BWPs were prepared in accordance with the BWP procedure. Both BWPs identified the work as non-recurring. During the past three years, only one beryllium sample in the evaporator and pump rooms identified beryllium as being present in the pump room ($0.119 \mu g/100 cm^2$). Because of the BHA, the area was conservatively posted as both a BRA and BCA until beryllium characterization was completed. The only potential discrepancy identified by the Independent Oversight team was the time lag between the site walkdown on February 24, 2011, when preparing the BHA and the issuance of the BWP on September 5, 2012. The WRPS explanation for the 1½ year lapse between the hazard assessment walkdown and issuance of the permit was that the work package was in process for that length of time because the evaporator is rarely accessed due to the high radiological conditions. The WRPS IHs indicated their belief that conditions had not changed during the period. Although the BWP procedure limits the validity of the BWP to one year from the date of the issuance of the BWP, the BWP procedure does not limit the time span from when the BHA walkdown is performed to when the BWP is approved.

For Building 272WA, the BHA addressed the opening and closing of fire riser valves in support of alarm and semi-annual flow tests. The work is recurring, with alarm tests performed quarterly and flow tests performed semi-annually. The area to be entered was localized and posted as a BCA due to surface dust, which had been sampled and indicated a maximum beryllium concentration of $0.32 \mu g/100 cm^2$. The Independent Oversight team found the BHA and BWP to be well documented, supported by previous beryllium sampling and hazard assessments, and consistent with the requirements of the BWP procedure.

4.7 Implementation of the BWP by CH2M-Hill Plateau Remediation Company

The Independent Oversight team's review of CHPRC's implementation of the Hanford job-specific BWP process focused on work at the Plutonium Finishing Plant (PFP), since this facility was the only CHPRC facility with BWP work during the onsite period.

Adequate beryllium controls were established through the BWP, and radiological controls were established for observed PFP activities. Work was well defined in work control documents for most of the activities that the Independent Oversight team observed. The potential beryllium hazards and associated controls were adequately defined in BWPs. Workers demonstrated appropriate beryllium and radiological controls during donning and doffing of personal protective equipment (PPE), as well as survey (for potential radiological contaminants) and contamination control techniques while exiting BCAs and radiological boundaries.

Most hazards were adequately identified and analyzed before work began. Beryllium hazards were adequately identified and characterized in BWPs and BHAs, and by IHs, for all jobs that the Independent Oversight team reviewed at PFP.

Several work evolutions were observed where beryllium and radiological controls were employed without incident, including glovebox surveillance and maintenance, glove bag smoke testing, attempted removal of a vacuum line, and mechanical isolation and removal of system piping. Computer-based access controls, through use of the site RWP issuance process and supervisors' use of the Hanford Site Worker Eligibility Tool (HSWET), continue to serve the site well in confirming workers' training status and ensuring that individuals are current with all beryllium-qualified worker requirements before conducting beryllium work. During the review, it was noted that the HSWET had become unavailable for use by supervision (for two short periods); however, this situation was managed in a conservative manner, in that supervision did not authorize the individuals to work until their status could be confirmed (ultimately by HSWET later that same morning). The combination of engineering controls (primarily containments and gloveboxes), administrative controls (in conjunction with PPE), and a knowledgeable and professional workforce (including industrial hygiene staff) significantly benefits the site's ability to ensure that sound beryllium controls are established and maintained.

Some work planning deficiencies unnecessarily placed workers at some additional risk of beryllium exposure. During one work evolution, a team of workers (pipe fitters, operators, and radiological control technicians) accessed a BCA to remove a 17-inch vacuum line. Entry into the area (which was also controlled for radiological hazards) necessitated donning multiple layers of PPE, including respiratory protection, and climbing ladders to access scaffolding to reach the piping systems. After the pre-job briefing and donning of PPE, workers entered the BCA. Once the work crew assembled at the elevated work location, they determined that the items could not be removed without being disconnected elsewhere first. The crew subsequently left the area without incident. The Independent Oversight team noted that even though the area where the piping systems were located is entered regularly for glovebox surveillance and maintenance, no one had noticed that the piping could not be immediately disconnected. If the job had been appropriately planned and/or walked down, workers would not have been sent into the area until the task was better defined. As it was, the attempt resulted in not only inefficiency, but also unnecessary additional potential risk to workers. During a second work observation, operators hoisted a component (estimated to weigh about 40 pounds) with a rope and passed the object down from the scaffolding by dangling it from the same rope, to be grasped by workers on the floor below. The PPE for this activity consisted of the standard radiological anti-contamination ensemble, including three pairs of nitrile surgical-type gloves. Work planning for this task failed to identify the need for workers to wear leather gloves to prevent a potential breach of the PPE and to appropriately handle/control the hoisting and lowering of the object by rope.

Additionally, workers have expressed concerns about how the job-specific BWPs are implemented at PFP. The rationale for implementation of the BWP process at PFP is set forth in the resolution forms associated with the BWP procedure, and CHPRC workers who reside at PFP are accustomed to using the current suite of BWPs for largely routine types of work activities. However, workers who are assigned transient tasks at PFP (primarily from other contractors) find that the BWPs are different from that they expect, based on their experience and training at their home organizations. This contrast appears to be largely a communication shortcoming and may require additional coverage during pre-job briefings for mixed contractor work crews. A similar concern exists for IH availability for conducting pre-job briefings; the PFP process requires that an IH provide only the initial BWP briefing and allows the work supervisor to cover the BWP requirements for the same work scope in subsequent briefings. Again, workers who are assigned transient tasks at PFP (primarily from other contractors) find the IH work coverage different from their expectations, based on their experience and training at their home organizations. This, too, appears to be largely a communication shortcoming and may require additional coverage during pre-job briefings for mixed contractor work crews. However, the Independent Oversight team noted, and the PFP IH staff confirmed, that IH presence in the field is limited, given the large number of tasks, assignments, and meetings. (See **OFI-6** in Section 6.)

4.8 Implementation of the BWP by Washington Closure Hanford

The Independent Oversight team's review of WCH's implementation of the Hanford job-specific BWP process focused on three projects involving active BCAs. WCH uses corporate and subcontracted workers to accomplish their mission. WCH staff primarily fulfills management and operation roles (IH, safety, radiation control, planners, maintenance, equipment operators, etc.) for facility demolition and waste trench remediation. Subcontractors manage the Environmental Restoration Disposal Facility (ERDF), field remediation activities (mostly contaminated soil removal), and miscellaneous projects, such as vault, tank, pipe, and other below-grade demolition.

WCH subcontractors are required by contract to follow the Hanford Site CBDPP and must have WCH management approval before the start of any work project. The Independent Oversight team discussed the WCH and WCH subcontractor requirements for beryllium work activities, beryllium project oversight, work site characterization, work authorization, and BWP formulation with the WCH IH/beryllium program lead. A copy of the subcontractor (Exhibit G "ES&H Requirements"), along with the WCH subcontractor industrial hygiene program WCH procedure SH-1-4.26 Rev 0 was found to be supportive of the site BWP/BHA procedure. Based on detailed discussions of the beryllium section of the weekly industrial hygiene field visit checklist, it was apparent to the Independent Oversight team that the site beryllium program was a priority with managers, supervisors, workers, and the WCH environment, safety, and health (ES&H) staff.

The Independent Oversight team, escorted by the WCH IH/beryllium program lead, visited three current WCH projects with BCAs, observed planning and pre-job briefing meetings, observed beryllium work activities, and interviewed workers, managers, and administrative staff. Beryllium program documentation was posted at each project location and included the current site CBDPP, project-specific BWPs, BHAs, beryllium IH worksite survey results with personal identification numbers if any exposure value was exceeded, applicable sign-in sheets, a copy of the project Health and Safety Plan (HASP), and project work task instructions. WCH and its subcontractors have revised their BWP/BHA process to comply with the current site procedure, which requires BWPs to be task-specific so that hazards and controls are clearly communicated to workers. The Independent Oversight team found the project-specific beryllium documentation to be consistent with the current BWP procedure.

The Area 300, Building 329 demolition pre-job briefing included a review of the BWP for workers and support personnel. The briefing also included required training and certification reminders for workers and PPE for that day's work scope. The briefing instructions were consistent with the task-specific BWP, and questions from the workers were addressed in a professional manner. Interviews/discussions with the WCH field work supervisor and the project IH demonstrated that they were knowledgeable of the beryllium program requirements to ensure compliance with the CBDPP and BWP process. The Independent Oversight team's review of the Building 329 work planning documents, job task instructions, postings, WCH/HASP Section 5.13.2 (Beryllium), and BWP-WCH-32912003 rev. 1 noted no concerns.

Several workers were observed dressing out in PPE as prescribed by the BWP. Donning was completed as required in the BWP. During the pre-job briefing, engineering and administrative control methods for beryllium dust minimization were discussed, including water and chemical sealing agents (Soil Sement ™ and Dust Bond). In addition, the pre-job briefing addressed material safety data sheets for chemicals used to control dust, as well as all applicable safety precautions. The site industrial hygiene database and WCH BWP/BHA software were demonstrated, and several area beryllium samples required by the task-specific BWP were reviewed.

The Independent Oversight team observed waste trench removal activities in the area 618-10 waste site, participated in a detailed tour of the site, and observed work activities related to several task-specific

BWPs. The WCH Project lead IH demonstrated an effective knowledge of the site beryllium program requirements. The project's task-specific BWP/BHA, IH survey strategy, survey results, required PPE, postings, engineering and administrative controls, and special issues identified with waste retrieval activities (odd size articles) were found to be consistent with the site-specific BWP procedure. Specific strategies for minimizing unnecessary beryllium contamination were noted during Independent Oversight's tour, including staging backhoes at the edge of a BCA, putting only the "stick" and bucket across the BCA boundary, and moving clean soil over potentially contaminated soil so equipment would not need decontamination.

The ERDF, managed by Stoller Corporation, has expanded its capacity by adding two new disposal cells, several new access ramps to streamline traffic flow, and a new permanent maintenance facility as a result of Federal stimulus funding. The subcontractor and WCH have characterized the ERDF beryllium hazards and implemented five task-specific BWPs. The plan of the day and pre-job briefing included a review of the BWPs in force for the day's activities. The actual BWP forms were available for workers to review as necessary. The WCH/ERDF lead IH is directly involved in all aspects of ERDF activities involving beryllium, and the subcontractor lead IH effectively outlined the ERDF IH sample plan, including a discussion of last year's beryllium survey data. A white paper authored by the ERDF senior IH, entitled "ERDF Negative Exposure Assessment, Inventory and Controls," resulted in downposting of the active disposal area and attested to the rigor of the controls (administrative and engineering) at the disposal facility.

WCH has continued to support the BeCAP Core Committee and the CBDPP Committee and has effectively implemented the Hanford Site BWP/BHA procedure (DOE 0342-001). WCH has also established a process to ensure that its subcontractors comply with all site beryllium requirements and has deployed WCH project managers to provide assistance and oversight to all projects involving BCAs.

5.0 CONCLUSIONS

RL, ORP, and the four major Hanford Site prime contractors continue to pursue the development of sitewide beryllium programs and processes to improve identification and control of beryllium hazards, and are actively engaged in implementing the Hanford Site BeCAP. However, much work remains, and only a few of the long-term actions are complete and in place. Managers of RL, ORP and Hanford Site contractors have implemented interim measures that have been designed and implemented such that risks to workers are controlled and thus the slow rate of progress is believed by site management not to cause unacceptable risks to workers. However, they should increase focus on timely completion of products and early assessment of implementation of new products to ensure consistency and adequacy of implementation. Additionally, as the process has progressed towards implementation, some stakeholders in the process have indicated declining levels of confidence and trust, and observations by the Independent Oversight team indicated some slippage towards old behaviors that were not supportive of a respectful environment. Management intervention will be needed to reverse this trend.

During this review, the Independent Oversight team focused on the effectiveness of the implementation of the BWP and associated training, which was the first of a number of significant beryllium program products to be implemented at the Hanford Site. The team also observed pilot training for assessment, characterization, and posting.

The Independent Oversight team found the BWP procedures to be well-written and consistent with the requirements of the CBDPP and 10 CFR 850. Similarly, BWP training programs effectively communicate the requirements of the BWP procedure and the CBDPP. The Independent Oversight team also had an opportunity to observe implementation of the BWP process in the field and with each of the

four Hanford Site contractors, although two of the contractors (MSA and WRPS) have had minimal need to implement the BWP process at the present time. In general, the Independent Oversight team concluded that the BWP process is being implemented in the field in accordance with the BWP procedure and associated training. However, the Independent Oversight team also identified a number of potential opportunities to improve the BWP program, both in program design and implementation. Overall, the Independent Oversight team concluded that the observed pilot training was thorough and well organized, and it provided opportunities for feedback from various segments of the workforce that would result in improvements to both the context and style of presentation.

6.0 OPPORTUNITIES FOR IMPROVEMENT

This Independent Oversight review identified the following OFIs. These potential enhancements are not intended to be prescriptive or mandatory. Rather, they are offered to the site to be reviewed and evaluated by the responsible line management organizations and accepted, rejected, or modified as appropriate, in accordance with site-specific program objectives and priorities.

OFI-1: Enhance mechanisms to ensure that interim changes to beryllium procedures (e.g., BWP Procedure), when required, are easily understood, manageable, and readily accessible by the workforce. Procedure changes that are provided as guidance should be clearly distinguished from changes that are mandatory and require immediate implementation. If practical, it may be useful to post a master "redline/ strikeout" version of the current procedure on the Hanford beryllium web site that incorporates all changes to date.

OFI-2: When developing and issuing new beryllium products, the beryllium product development teams must be aware that the products are interrelated and should strive to avoid introducing terminology that may not be defined or available for use until subsequent products are released (e.g., referring to BSA in the BWP procedure). However, the timely development and implementation of new beryllium products is important so mechanisms to address this concern should be designed in a manner that does not introduce further delays.

OFI-3: Take steps to ensure that the beryllium sampling data communicated to workers through the BWP and BHA is useful, accurate, and consistent and that it is as clear as possible with respect to risk. If sampling data "averages" are to be provided, ensure that the average values are calculated consistently. Also, determine whether greater use of Bayesian statistics (as recommended by the American Industrial Hygiene Association Exposure Assessment Committee) might ensure more consistency in professional judgments based on sampling data (e.g., to post or not post areas) and provide a more useful means of communicating sampling results to workers.

OFI-4: Provide clear and unambiguous training requirements in beryllium procedures to ensure that workers, subject matter experts, line managers, and the training staff agree on the minimum training and qualification requirements for performing a beryllium work task.

OFI-5: Ensure that valid assessments of BeCAP product implementation through surveillances or other assessment activities are conducted early to ensure correct implementation. As a minimum, collate and assess data from early surveillances of BeCAP product implementation and if the data provides an adequate assessment of implementation, use the results to support decisions for transitioning products from the BeCAP Core Committee to the CBDPP Committee and prior to disbanding product teams to ensure that transitions of processes to implementation have been successful to date.

OFI-6: Consider augmenting pre-job briefings to include a discussion of the resolution forms associated

with the BWP procedure in order to inform newly assigned or transient workers (primarily from other contractors) who may find that the implementation of beryllium controls (BWPs, IH coverage, etc.) differs from their expectations, based on their experience and training at their home organizations.

7.0 ITEMS FOR FOLLOW-UP

Independent Oversight will continue to follow up on the implementation of key BeCAP processes as they progress toward completion. This will include assessment of BeCAP product implementation.

Appendix A
Office of Health, Safety and Security Team Composition

Dates of Review

Onsite Review: November 26-30, 2012

Office of Health, Safety and Security Management

Glenn S. Podonsky, Chief Health, Safety and Security Officer
William A. Eckroade, Principal Deputy Chief for Mission Support Operations
John S. Boulden III, Director, Office of Enforcement and Oversight
Thomas R. Staker, Deputy Director for Oversight, Office of Enforcement and Oversight
William E. Miller, Deputy Director, Office of Safety and Emergency Management Evaluations

Quality Review Board

William A. Eckroade
John S. Boulden III
Thomas R. Staker
George E. Armstrong
Michael A. Kilpatrick

Review Team

Thomas R. Staker, Team Leader
Marvin J. Mielke
Joseph Lischinsky
James R. Lockridge