Cameco

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April 16, 2010

Mr. Doug Mandeville
U.S. Nuclear Regulatory Commission
11545 Rockville Pike
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Rockville MD 20852-2738

RE: Request for Additional Information – 2009 Surety Estimate for Smith Ranch – Highland Uranium Project – Source Materials License SUA-1548 (TAC J00514)

Dear Mr. Mandeville:

Power Resources, Inc. d/b/a Cameco Resources (CR) has received the U.S. Nuclear Regulatory Commission's request dated December 11, 2009, for additional information and clarification pertaining to CR's July 2009 surety estimate update. The attachment provides responses to each of the NRC's comments contained in the December 2009 letter.

Please contact Angelo Kallas at (307) 358-6541 ext. 474 if you have any questions.

Sincerely,

Thomas P. Young
Vice President, Operations

cc: T. Cannon
J. Brister
L. Spackman, WDEQ
File SR 4.6.4.1

**NRC Comment 1 — Number of pore volumes required to complete groundwater restoration.** Power Resources, Inc. (PRI) has submitted a surety estimate that assumes a total of nine pore volumes for groundwater restoration. This includes one pore volume of groundwater sweep and eight pore volumes of reverse osmosis (RO) treatment. NRC staff notes that this represents a significant increase in the amount of restoration effort planned for the facility. NRC staff also notes that parts of the Smith Ranch facility have been in operation for more than 20 years and PRI has a demonstrated performance record for groundwater restoration. Given this performance record, PRI has documented site specific field information on the success of the restoration methods it has employed and the number of pore volumes historically required. The table below provides a summary of this information.

| Mine Unit | Number of Pore Volumes Required to Complete Groundwater Restoration | Reference | Status |
|---|---|---|---|
| A | 15 | PRI, 2004 | WDEQ and NRC approved |
| B | 19.32 | PRI, 2009a | WDEQ approved |
| C | 18.5 to date | PRI, 2009b | In restoration |
| 1 | 2.6 to date | PRI, 2009b | In restoration |

Given the past performance of groundwater restoration at PRI, a surety based on nine pore volumes may not be adequate to restore groundwater to the required conditions. Note that Wyoming Department of Environmental Quality (WDEQ) requirements for groundwater restoration are different from the NRC's requirements, so the NRC cannot necessarily rely on WDEQ's review and approval for this issue. Further discussion related to the groundwater restoration standard for in-situ recovery (ISR) facilities can be found in NRC Regulatory Issue Summary 09-05 (NRC, 2009a). Note that on several previous occasions, NRC staff has indicated that the number of pore volumes used in surety estimates should be based on completed groundwater restorations (NRC, 2008a; NRC, 2008b). As a result, please provide additional information to support PRI's current estimate of nine pore volumes necessary to complete ground water restoration at SR-HUP wellfields or revise the pore volume estimate based on completed restorations.

**CR Response:** CR acknowledges that past restoration efforts have not been completed as efficiently as the restoration pore volumes stated in the surety estimate. Different methods including groundwater sweep proved only marginally effective in improving groundwater quality. Several pore volumes of treatment were necessary to arrive at that conclusion. The process of using ion exchange and reverse osmosis concurrently entailed a period of understanding to ascertain the effectiveness at improving water quality and minimizing mechanical failures, resulting in more pore volume throughput than initially expected. Mine Units A and B were also the first units using chemical and biological reductants on an experimental basis to expedite restoration, and as a result incurred a trial and error phase which also contributed to an increased number of pore volumes to achieve full restoration.

Restoration efforts in Mine Unit C have also taken more pore volumes than expected due to several reasons. First, the mine unit began restoration in C-North, initially with groundwater sweep, then ion exchange and reverse osmosis. During this time it was discovered that several injection well casings had failed so these wells were plugged and abandoned, leaving a limited number of wells to use for restoration. This slowed the conveyance of clean water injection throughout the aquifer, ultimately adding to the number of pore volumes of restoration at Mine Unit C. Additionally, Mine Unit C is in communication with the underground workings and this communication has adversely impacted the restoration progress in that Mine Unit.

Finally, during restoration of Mine Units, A, B, and C, the restoration progress was not effectively tracked, and ion exchange (concurrent with reverse osmosis) continued on for several more pore volumes than was necessary. Therefore, the number of pore volumes employed to restore Mine Units A, B, and C are not truly representative of the actual number of pore volumes needed for restoration.

CR restoration efforts to date have yielded much information that will ultimately improve future restoration activities. At this time, CR believes that the concurrent use of reverse osmosis and ion exchange will decrease the number of pore volumes needed to complete restoration.

**NRC Comment 2 — Groundwater restoration costs for mine units in "standby."** It has come to the attention of NRC staff that PRI has stopped maintaining the bleed in mine units which are in shut-in or standby mode (specifically, mine units D, D-ext, E, F, 4/4A/4ext). The NRC staff is concerned about the effects this may have on the amount of restoration effort necessary to meet the required groundwater restoration standards at these mine units. For example, without maintaining a bleed, any production fluids present at the end of the recovery process will have had a chance to follow the natural groundwater flow direction. The flow direction could take the production fluids outside of the recovery zone. The staff notes that the perimeter monitoring wells remained in service to detect excursions. However, the production fluids may have migrated outside the recovery zone. As the affected volume may be larger than originally anticipated, some type of adjustment to the amount of restoration required may be warranted. This could be reflected by increasing the number of pore volumes required to restore these mine units, adjusting the flare factor to account for production fluids outside the recovery zone, increasing the length of time required to achieve the restoration target values, or implementing some other method proposed by PRI. The staff requests that PRI provide additional information supporting the current restoration estimate in these mine units, or revise the estimate and provide justification addressing the staff's comment.

**CR Response:** During recent onsite inspections by NRC staff, CR has been made aware of concerns regarding mine units on standby and the issue of potentially increasing the flare of mining fluids outside the recovery zone. As a result of these concerns, CR has begun control bleeds in each mine unit on standby. Mine Unit D is no longer in standby and has begun reverse osmosis and ion exchange restoration. Mine Unit D-extension remains on standby, however all header houses have been rebuilt, pumps are installed, and the mine unit can begin control bleeds once the work-overs on two deep disposal wells are completed in May or June 2010. Mine Unit E is on standby and restoration is scheduled to begin in July 2010. Mine Unit 4/4A is also

scheduled to begin restoration in July 2010. In addition, control bleeds are now being maintained in Mine Units E, F, and 4/4A.

CR would like to note that the reference to Mine Unit 4Ext in the July 2009 surety estimate was based on proposed 2009-2010 wellfield expansion activities at the time of the submittal. CR has not yet initiated expansion activities in the Mine Unit 4Ext area and will re-assess plans for this mine unit extension as part of the June 2010 surety estimate update.

CR believes that all concerns of increased flare from recovery zones in mine units that are on standby have been addressed and no changes are deemed necessary to revise the flare factor or increase the number of pore volumes required for restoration.

**NRC Comment 3 — Groundwater restoration costs for mine units with long-term or repeated excursions.** The staff notes that wells in Mine Unit C have been on long-term excursion status. Section 5.7.8.3 of NUREG-1569 (NRC, 2003) recommends that an increase to the surety amount be made if an excursion lasts more than 60 days. This increase to the surety should cover the expected full cost of correcting and cleaning up the excursion. The increase in the surety could be achieved through: increasing the flare factor for the particular mine unit; increasing the number of pore volumes required for restoration; performing targeted restoration in a portion of the mine unit; or implementing some other approach that the staff approves. The staff requests that PRI justify that the proposed restoration estimates will be capable of correcting long term excursions in Mine Unit C (or other mine units with long term excursions). Alternatively, PRI should revise the surety estimate in a manner acceptable to the staff.

**CR Response:** Currently at Smith Ranch-Highland (SRH), two wells (DM-3 and CM-32) are identified as long-term excursion wells. Mine Unit D is currently in restoration as previously noted and efforts are being implemented to resolve the excursion at DM-3. The excursion at DM-3 is defined as a non-conventional excursion whereas the excursion is caused by the underground mine workings and haulage way in connection with Mine Unit C, and not from the mining fluids from the Mine Unit D recovery zone. The restoration of the haulage way and underground workings is currently accounted for in the surety estimate.

The restoration cost for the excursion at CM-32 was not reflected in the surety estimate. However, CR has found costs in the surety estimate that were designated for a previously corrected excursion in Mine Unit C at CM-15. CR plans to move the costs for correcting the excursion at CM-15 (in the C-19N column) to the C-22 column to account for restoration costs for the excursion at CM-32. Therefore, the surety cost estimate that was appropriate for CM-15 is appropriate for CM-32.

**NRC Comment 4 — Revisions to mine unit parameters.** The staff notes that in several instances, the basic parameters of individual mine units have changed from previous surety submittals. The staff understands that PRI is capable of switching individual wells between production and injection mode to optimize recovery techniques and that some parameters will change as a mine unit is expanded or as decommissioning activities are completed. The staff identified several instances where the number of wells, ore zone thickness, flare factor, and mine unit area changed in mine

units that appear to have been fully constructed and are not undergoing decommissioning activities. The reasons for these changes are not clear as, in general, the NRC staff would not expect the physical characteristics of a mine unit to change significantly when it is in operation. A few examples comparing the surety estimate submitted in 2007 (PRI, 2007a and 2007b) to the recent submittal include:

- Mine Unit 1 — the total number of wells (injection, production, and monitoring) **decreased** from 374 to 261.
- Mine Unit 2 — the average completed thickness for the wells decreased from 24 ft to 23 ft.
- Mine Unit 3 — the average completed thickness for the wells decreased from 20 ft to 17 ft.
- Mine Unit C — the mine unit area decreased by 4.75 acres.

The examples cited above are not a complete list. Please provide additional information or discussion supporting the changes to these parameters for the individual mine units.

**CR Response:** CR has evaluated and compared the mine unit areas in the 2007 surety estimates to those proposed in 2009. Attachment 1 provides detail regarding the rationale for the changes in mine unit acres that occurred. As noted in Attachment 1, many of the changes in the 2009 surety estimate were the result of more accurate mapping of pattern areas using mapping software applications. Historically, mine unit areas had been calculated based on the average size of (five-spot) pattern areas in each mine unit and the total number of patterns in the mine unit.

Regarding changes in the number of wells, ore zone thickness and flare factor for various mine units in the 2007 vs 2009 surety estimates, CR is currently evaluating the basis for these changes and will either adjust the surety estimate or provide additional information supporting the changes, as appropriate, in the June 2010 surety estimate update.

**NRC Comment 5 — Clean up costs for known spill locations.** The staff notes that the well abandonment (WA) worksheet includes costs for contaminated soil disposal around individual wellheads and that the wellfield (WF) reclamation worksheet includes costs for contaminated soil disposal around header houses. However, the staff notes that, in many cases, the reported releases of fluids at the site may not be in the vicinity of a wellhead or header house. These releases may require additional radiological surveys and disposal during surface reclamation activities. The staff requests that PRI identify where these costs are contained in the surety estimate, or revise the estimate to include these costs.

**CR Response:** To plan for required contaminated soil disposal, CR made the assumption that soils around <u>all</u> wells would require removal and disposal. (Note: While preparing this response, CR discovered an error in the SR calculations, in that an incorrect amount for transportation and disposal costs had been selected. The error was resulting in a cost being shown of $193.85/well clean up when in reality this number should be $120.96/well cleanup. This correction has been made and will be provided with the update to the surety in June). With the correction, CR notes that a total of $971,305.80 is estimated for HUP and SR well cleanup activities. CR believes that by providing nearly one million dollars for soil removal and disposal should more than adequately

provide for clean up at all sites required, given that CR should not, in reality experience spills requiring cleanup at all well locations.

**NRC Comment 6 - Estimate for Mechanical Integrity Testing (MIT).** License condition (LC) 10.1.3 and Section 3.2.4.6 of the most recent version of PRI's application (PRI, 2003) outline MIT requirements for Smith Ranch and Highland Uranium Project. These documents require that PRI perform MITs on injection and production wells before they are put into service and on a 5 year frequency for injection wells after service begins. MITs are also required on wells that have been serviced with a downhole bit or underreaming. The staff notes that the unit cost (UC) MIT worksheet includes a combined equipment and labor cost rate of $110/hour. The staff requests that the equipment and labor costs be separated so the rates can be verified. The staff also notes that the formula used to calculate MIT costs assume that 1/5 of the cost is incurred each year. However, a well in service for only 24 months will incur an actual cost of one MIT test, not 2/5 the cost of one test. Similarly, a well in service for 72 months will need to be tested twice, not 6/5 the cost of one test. The staff requests that PRI either justify the use of the MIT cost formula, or revise the formula to address the above comment.

**CR Response:** CR has refined the costs on the UC-MIT worksheet. Estimated costs for pulling unit and MIT unit are closer to $100 /hr than $110 /hr. This change has been made and labor costs have been added to correct the omission. Also, recent experience dictates that the number of MITs that are able to be completed per day with the requisite labor and equipment is $4/day instead of $6/day. This correction has been made (corrections to the surety spreadsheets will be provided with the submittal of the updated surety estimate in June 2010).

With regard to the number of MITs to be performed, if a well is "projected" the spreadsheet needs to account for an initial MIT. If a well is already existing the initial costs for its MIT have already been incurred. In the example above for an existing well in service for 72 months, one MIT is required at 60 months and not 6/5 of the value of an MIT. Corrections have been made to the spreadsheets to 1) add the costs for initial MITs in situations where the wells are "projected wells" and 2) round the value down as an integer when there is a fraction after dividing by five years. If a given well is existing and the need for the well does not exceed five years, zero additional MITs will be required for this well as the initial MIT has already been performed and no MIT would be due during its life.

CR would like to note that Section 3.2.4.6 (PRI, 2003) referenced above is not the most current version of CR's application. The most current version of CR's application was submitted in 2004 as part of the Reynolds Ranch license amendment application and subsequently updated in March 2006 prior to the NRC's approval in January 2007. Section 3.2.4.6 of this update contains the most recent versions of the MIT requirements for the Smith Ranch-Highland Uranium Project.

**NRC Comment 7 — Basis for Capital Program Cost Estimates.** The staff notes that PRI has not provided a basis or reference for the items comprising the capital program costs shown on page 33 of the Highland Uranium Project estimate (MasterCosts worksheet). These capital program costs total $9.9 million and include specific line items for: brine reduction technology; reworking of deep disposal wells; engineering support; selenium plant construction; deep disposal well installation; purchase of a reverse osmosis unit; and construction of disposal well transmission lines. An

additional $3.8 million in capital program costs are shown on the MasterCosts worksheet for Smith Ranch. The Smith Ranch capital costs include: construction of a deep disposal well in the Southwest area, two reverse osmosis units, a decarbonator, a chipper, and two containers for solid waste disposal. The NRC staff requests that PRI provide a basis for the cost of these items.

**CR Response:** CR evaluated the capital program costs included in the July 2009 surety estimates and has determined that many of the items should be removed because their costs have already been incurred. The remaining items were estimated based on quotations from vendors and historical NRC license/inspection fees. See Attachment 2 for more details. The spreadsheets will be updated to remove the outdated items and provide the basis for the remaining estimates in the June 2010 surety update.

**NRC Comment 8 - Well and Delineation Hole Abandonment Unit Costs for Highland Uranium Project.** The staff notes that the well abandonment unit costs per foot for Highland are calculated based on an average of 700-foot deep holes. This calculation is shown on the unit cost well abandonment (UC-WA) worksheet. However, the WA worksheet indicates that production, injection, and perimeter monitor wells range from 450 feet to 650 feet deep, with an average of 544 feet. Basing the cost per foot on a deeper well will result in a lower overall cost for well abandonment at Highland. Note that for the Smith Ranch estimate, the well abandonment unit cost per foot is based on an average 700-ft deep well and the average depth of the production, injection, and perimeter monitor wells is 725 ft. The staff requests that PRI either provide a justification for basing the Highland well abandonment unit cost on the 700 ft depth, or revise the cost estimate to reflect the actual average depth on the Highland portion of the site.

**CR Response:** CR calculates that of 4634 wells shown at Highland, the average well depth is 558 ft. For Smith Ranch CR calculates that of 4811 wells shown, the average well depth is 746 ft. (There was an error in the totals column that did not reflect the average of all of the wells shown. CR has corrected this error.) The average depth of all wells collectively therefore is 654 ft. CR believes that the using the 700 ft depth as an average for planning costs was a conservative approach as the costs would be slightly higher for well abandonment of a deeper well. CR therefore does not believe that a change is necessary.

**NRC Comment 9 - Estimate for Building Demolition and Disposal at Highland Uranium Project.** The staff notes that the subtotal cost for decontamination and demolition on the "BLDGS" worksheet for the Highland estimate needs to be updated to capture the costs for the Exxon R&D and Exxon Process buildings. It appears that the formulas in rows 18 and 34 of the spreadsheet should be corrected to include columns AC and AD, which would raise the total for Building Demolition and Disposal costs (Row 74) from $2.294 million to $2.321 million. The staff requests that PRI correct this formula error.

**CR Response:** CR has corrected the formula errors. Corrected spreadsheets will be provided with the updated surety estimate in June 2010.

**NRC Comment 10 - Labor Cost Estimates.** The MasterCosts worksheet contains labor cost estimates using the latest available data obtained from the U.S. Bureau of Labor in 2007. The staff notes that labor rates in Wyoming may have changed since 2007. The staff requests that

PRI provide additional support for the labor cost estimates to demonstrate that these rates are at least equivalent to current costs that would be incurred by an independent third party.

**CR Response:** CR has evaluated the 2007 labor costs shown compared to the updated 2008 State Occupational Employment and Wage Estimates for Wyoming from the US Department of Labor, Bureau of Labor Statistics. The results of the comparison are shown in Attachment 3. For the categories of labor used in the surety estimate there would be a total 5.1% increase in labor costs using the updated figures. CR will use the latest labor estimate costs when updating the June 2010 surety estimate.

**NRC Comment 11 - Support for Equipment Cost Estimates for Both Highland Uranium Project and Smith Ranch.** The staff notes that PRI provided equipment cost estimates on the MasterCosts worksheet. NRC generally requires the cost of remedial project equipment to be estimated based on the assumption that such equipment will be supplied by a third party contractor, at third-party rates. It appears that the equipment costs may be based on existing contracts between PRI and vendors. It is not clear if equipment will be available at these rates if a third party contractor is needed to complete decommissioning at the facility. The staff requests that PRI explain the basis for the equipment unit rates and verify that these unit rates will be available to a third party contractor, if necessary.

**CR Response:** It is true that equipment costs have in some instances been based on existing contracts with CR's vendors. However CR has no evidence that a third party would not be able to negotiate similar rates with the vendors that CR uses.

**Comment 12 - Estimates for Miscellaneous Costs.** PRI has developed the surety estimate unit costs based on either WDEQ Guideline 12 or recent site-specific experience. That approach is generally acceptable to the NRC, provided that the total surety estimate represents the costs that would be incurred by an independent third party performing the decommissioning activities. The staff has not identified where miscellaneous costs that would be incurred by an independent third party are addressed in the surety estimate. Specifically, the costs for an independent third party to manage the decommissioning effort over the long term, (including administration and accounting costs), and maintenance of security around restricted buildings do not appear to be addressed. The staff requests that PRI either identify where these costs are contained in the surety estimate, or revise the surety estimate to include these items.

**CR Response:** In negotiations with the Wyoming Department of Environmental Quality (WDEQ), CR will be updating its surety estimates to include a 25% contingency (increased from 15%). Guideline 12 costs are reflect costs that would be incurred for specific activities regardless of the responsible party and in many instances site-specific experience has included experience with third party subcontractors performing the work. CR believes that by increasing the contingency to 25%, adequate funding will be available for a third party including any administration, accounting, and security costs.

**NRC Comment 13 — Unit Costs for Transportation and Disposal.** The staff notes that on the WF reclamation worksheet that rows 112 and 113 estimate the quantity of well house material that will be sent to an NRC licensed facility for disposal. This quantity is presented as a volume in cubic yards.

However, in row 114, the transportation and disposal unit cost appears to be provided in cubic feet. The staff requests that PRI use a unit cost for transportation and disposal that is based on the same units as the volume of material to be disposed. The staff also recommends that PRI review the other worksheets in the estimate to verify that unit costs for transportation and disposal are consistent with the volume of material to be disposed.

**CR Response:** Formulas were reviewed and corrected to use consistent units. Corrected spreadsheets will be provided with the updated surety estimate in June 2010.

**NRC Comment 14 — Density Correction Factor for Soil, Concrete, and Bulk Byproduct Material.** On the MasterCosts worksheet, PRI used a density correction factor of 0.54 tons per cubic yard for soil, concrete, and bulk byproduct material. The staff notes that concrete typically has a density correction factor of around 2 tons per cubic yard (based on a unit weight of 150 pounds per cubic foot) and that soil typically has a density correction factor of around 1.5 tons per cubic yard (based on a unit weight of 115 pounds per cubic foot). The staff requests that PRI either justify the use of the lower density correction factor or revise the number based on the staff's comment.

**CR Response:** CR incorrectly used the term "density correction factor" when what was intended was "load correction factor". The load correction factor is the difference between solid material and when it is broken. Attachment 4 provides common load factors from the Caterpillar Performance Handbook and the Engineering Pocket Reference Guide. The load factor shown for concrete is 0.54.

# Attachment 1

## Comparison of Mine Unit Data 2007 to 2009 Surety NRC-WDEQ

Highland (HUP) Area

| Wellfield Area | | MU-A | MU-B | MU-C | C-19N | MU-D | MU-D Ext | MU-E | MU-F | MU-H | MU-I | MU-J | MU-JA | Totals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2007 | 3.49 | 15.86 | 29.25 | 0.75 | 6.42 | 4.96 | 22.83 | 76.86 | 25.62 | 20.46 | 27.55 | 9.18 | 243.23 |
| | 2009 | 3.49 | 15.86 | 24.50 | 7.46 | 7.50 | 4.63 | 22.31 | 78.79 | 28.07 | 26.33 | 26.37 | - | 245.31 |
| | | - | - | (4.75) | 6.71 | 1.08 | (0.33) | (0.52) | 1.93 | 2.45 | 5.87 | (1.18) | (9.18) | 2.08 |

Note:
1. MU-JA has not been developed and is not anticipated to be developed in the next few years, therefore acreage was deleted
2. MU-C was reduced by 4.75 Acres and C-19N area was increased by 6.71 acres based on more accurate mapping of pattern areas
3. MU-D area was increased by 1.08 acres based on more accurate mapping of pattern areas
4. MU-F, H and I areas were increased due to more accurate mapping of pattern areas
5. MU-D Ext. , E and J had decreases in area due to more accurate mapping of pattern areas.
6. The difference between 2007 and 2009 surety estimates is a net increase in area of 2.08 acres. Without the decrease for the MU-JA development ,which was never constructed, there was an increase of 11.26 acres

Smith Ranch Area

| Wellfield Area | | MU-1 | MU-2 | MU-3 | MU-3 2nd Comp | MU-4/4A | MU-15 | MU-15A | MU-K | MU-9 | MU-27 | MU-7 | | Totals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2007 | 25.60 | 51.90 | 37.20 | 18.00 | 62.50 | 59.70 | 18.40 | 23.00 | 59.70 | - | - | - | 356.00 |
| | 2009 | 25.44 | 52.14 | 41.10 | - | 62.56 | 58.64 | 22.27 | 41.64 | 44.34 | 40.50 | 24.79 | - | 413.42 |
| | diff | (0.16) | 0.24 | 3.90 | (18.00) | 0.06 | (1.06) | 3.87 | 18.64 | (15.36) | 40.50 | 24.79 | - | 57.42 |

Note:
1. MUs 2, 3, 4/4A, 15A, K increased in area as compared with the 2007 surety estimate due to a combination of more accurate mapping and planned expansion activities.
2. MU-9 area decreased from the 2007 surety estimate due to more accurate mapping.
3. MUs 1 and 15 areas decreased due to more accurate mapping of the pattern areas.
4. MUs 27 and 7 areas were added due to anticipated mine development in those areas in 2010.
5. MU-3 2nd completion was dropped and not pursued in 2009.

# Attachment 2

# Capital Costs

| HUP Capital Program Costs | | 2009 | April, 2010 | Reason for Change | Cost Basis |
|---|---|---|---|---|---|
| Brine Reduction Technology | | $ 1,000,000 | $ - | Rejected Technology | |
| DDW x 2 Workovers | $1,000,000 | $ 2,000,000 | $ - | Completed | |
| (includes piping and powerline installation) | | | | | |
| Engineering | | $ 500,000 | $ - | Completed | |
| Selenium Plant | | $ 2,750,000 | $ - | Completed | |
| Deep Disposal Well | | $ 1,900,000 | $ - | Completed | |
| RO Unit | | $ 500,000 | $ - | Completed | |
| Disposal Well Transmission Lines | | $ 500,000 | $ - | Completed | |
| *NRC License/Inspection Fees (1/2 of 1,586,060/yr) | | $ 793,030 | $ 793,030 | | Based on Historical NRC Inspection Fees |
| TOTAL Capital Costs | | $ 9,943,030 | $ 793,030 | | |

| SR Capital Program Costs | | 2009 | April, 2010 | Reason for Change | Cost Basis |
|---|---|---|---|---|---|
| Deep Disposal Well, SW Area | | $ 1,900,000 | $ - | Completed | |
| RO Unit, CPP | | $ 500,000 | $ - | Completed | |
| RO Unit, Reynolds Ranch | | $ 500,000 | $ 500,000 | | Quotation - Simons Water Technology |
| Decarbonator, CPP | | $ 50,000 | $ - | Completed | |
| Chipper | | $ 50,000 | $ 50,000 | | Quotation - Vermeer Colorado |
| BFI Container x 2 | $7,800.00 | $ 15,600 | $ 15,600 | | Quotation - BFI Colorado |
| *NRC License/Inspection Fees (1/2 of 1,586,060/yr) | | $ 793,030 | $ 793,030 | | Based on Historical NRC Inspection Fees |
| TOTAL Capital Costs | | $ 3,808,630 | $ 1,358,630 | | |

*Fees are split between Highland Uranium Project and Smith Ranch

# Attachment 3

# NRC Comment 10 - Response - Labor Cost Estimates

Comparison of Wages 2007 versus 2008

| Bureau of Labor Statistics Classification | Cameco Resources Classification | MEAN Hrly 2007[1] | MEAN Hrly 2008[2] | Difference | % Diff |
|---|---|---|---|---|---|
| Management Occupations | Environmental Manager RSO | $ 33.47 | $ 36.16 | $ 2.69 | 8.0% |
| Hydrologist | Restoration Manager Hydrologist | $ 26.27 | $ 26.10 | $ (0.17) | -0.6% |
| Water Treatment & System Operator | Operator | $ 20.24 | $ 21.17 | $ 0.93 | 4.6% |
| Construction Laborers | Laborer | $ 13.12 | $ 14.62 | $ 1.50 | 11.4% |
| Civil Engineer | Engineer | $ 29.12 | $ 31.31 | $ 2.19 | 7.5% |
| Environmental Engineering Tech | Radiation Environmental Tech | $ 18.92 | $ 18.96 | $ 0.04 | 0.2% |
| | Average Wage | $ 23.52 | $ 24.72 | $ 1.20 | 5.1% |

Notes:

1. May, 2007 State Occupational Employment and Wage Estimates - Wyoming, US Department of Labor, Bureau of Labor Statistics
2. May, 2008 State Occupational Employment and Wage Estimates - Wyoming, US Department of Labor, Bureau of Labor Statistics
3. Labor rates as shown are unloaded CR estimate included a 1.30 multiplication factor for taxes and benefits

Average Labor Rates between 2007 and 2008 differ by 5.1% which is covered by the 25% contingency included in the estimate

# Attachment 4

## Load Correction Factors

Load Correction Factors - difference between solid material and when it is broken because of air space between the pieces of material, the coarser the material the lower the load factor ( or the finer the material the higher the factor). The use of density correction factor in the estimate is not correct it should have actually been called a load factor. The table below shows some examples of load factors for several common materials, including concrete. These factors are from the Caterpillar Performance Handbook and the Engineering Pocket Reference Guide.

| | Pounds/CY | | | |
|---|---|---|---|---|
| Material | Solid (bank) | Broken (Loose) | % Dif | Load Factor |
| Granite | 4536 | 2781 | 39% | 0.61 |
| Limestone | 4401 | 2619 | 40% | 0.60 |
| Sandstone | 3915 | 2538 | 35% | 0.65 |
| Concrete | 3996 | 2176 | 46% | 0.54 |
| Sand & gravel | 2700 | 2400 | 11% | 0.89 |