



September 28, 2011

Mr. Lowell Spackman, District 1 Supervisor
Land Quality Division
Wyoming Department of Environmental Quality
Herschler Building
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Cheyenne, WY 82002

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CERTIFIED MAIL #7011 0470 0000 7716 0126 RETURN RECEIPT REQUESTED

RE: HH 15-20 Wellfield Release, Mine Unit 15A, Remediation Proposal, Cameco Resources,
Permit 633

Dear Mr. Spackman,

Power Resources, Inc. d/b/a Cameco Resources (Cameco) is providing responses to comments in a letter dated September 22, 2011 from the Wyoming Department of Environmental Quality-Land Quality Division (WDEQ-LQD) regarding the proposal for the remediation of the header house 15-20 wellfield release of solutions submitted on September 14, 2011.

Please contact Ken Garoutte @ 307-358-6541, ext 476 or Kenneth_Garoutte@cameco.com if you have any questions.

Respectfully

A handwritten signature in black ink, appearing to read 'Brent Berg', written over a horizontal line.

Brent Berg
General Manager

BB/kg

Attachments: Response to LQD Comments
Revised HH 15-20 Remediation Proposal
Maps of HH 15-20 area of MU-15A

ec: Cameco Resources – Cheyenne

cc: File SR 4.3.3.1

Doug Mandeville, NRC (2 copies)
Document Control Desk, NRC

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FSME20

SOIL REMEDIATION PROPOSAL, HH 15-20 WELLFIELD RELEASE

Permit 633, Cameco Resources

Cameco Resources provided LQD with a soil remediation proposal in a letter dated September 14, 2011 for the release of solutions that occurred May 3, 2011. LQD provided review comments in a letter dated September 22, 2011. Below are the comments from LQD and responses provided by Cameco.

COMMENTS

1. *Please place stockpiled contaminated topsoil on liner material. (SI)*

Cameco Response: Under Phase II of the remediation proposal, Cameco describes how soil removed will be taken directly to approved DOT IP-1 11(e)2 byproduct containers. Cameco does not intend to stockpile removed soil; nonetheless, if stockpiling becomes necessary, Cameco will place the removed soil onto barrier liner(s) with erosion control measures to contain the soil.

2. *The crystal for the Ludlum is a sodium iodide crystal, not sodium iodine. Please correct the text. (SI)*

Cameco Response: The reference to the sodium iodide crystal has been corrected on the first line under Remediation Plan of the attached revised proposal.

3. *The spill area extends beyond the southernmost line of the grid. An additional line should be added to the south end of the grid. Please add an additional line to the south end of the grid. (SI)*

Cameco Response: A revised map of grid lines is contained in the attached revised proposal.

4. *The Ludlum meter has two accumulation times. Please specify which accumulator time will be used for the Ludlum. (SI)*

Cameco Response: The Ludlum meter will be set to accumulate counts per second over a one minute time period.

5. *CR has committed to removing, in increments of 2-5 inches, all contaminated soil material to the depth in which the solution release leached. Until the sampling and removal process is completed, the depth and volume of soil removal is not known. Soils in the area of the fluid release range from 1.7ft (20 in) to 2.0ft (24 in). The topsoil or A-horizon ranges from 2 in to 6 in. If no more than 10-12 in of material is removed, CR may be able to obtain successful reclamation by seeding and mulching directly into the subsoil that remains. However, if soil material is removed to greater depths, alternative sources of topsoil or organic material (composted manure) incorporation might be necessary. When all contaminated soil material is removed, the exposed surface material should be visually, evaluated for hand texture and organic matter content to determine if*

seeding directly into the subsoil will provide a good seedbed. If not, additional soil or organic manure additives should be considered. (LS)

Cameco Response: Cameco appreciates the guidelines given to help with our reclamation of the impacted areas. Cameco will conduct a visual evaluation to determine if direct seeding, additional soil, or organic additives should be applied if more than 12 inches of soil is removed.

6. *Please provide a map showing the topographic contours for identification of any drainages through the spill area. (PCR)*

Cameco Response: A second map is provided with the attached revised remediation proposal showing a wider view of the Mine Unit 15A spill area with topographical contours and drainage areas displayed.

**Mine Unit 15A Wellfield Release, Header House 15-20 Area
Soil Remediation Proposal
Cameco Resources Permit 633**

INTRODUCTION

Cameco provided LQD a written notification in a letter dated May 9, 2011 of a release of solutions that occurred in wellfield 15A, header house 15-20 on May 3, 2011. Verbal notification of the release was provided to LQD on May 4, 2011. The written report estimated 1500 gallons of production fluid was released impacting an area of approximately 12,077 square feet.

The release involved eight (8) production wells (15P-409 through 15P-416). The impacted area was mapped using a Trimble GPS unit with the results transferred to the Smith Ranch-Highland Site Map for archiving. The impacted area was gamma surveyed using an unshielded Ludlum Model 19 MicroR meter and soil sampled at ten (10) locations including a background sample. See Table 1. The sample results indicated nine (9) sample locations were above the 5 pCi/g decommissioning criteria established by the NRC. A map showing the areas of impacted soil is attached for your review.

SOIL SAMPLING RESULTS

The sample results for uranium are reported in mg/Kg and require conversion to pCi/g, while the results for radium226 are reported in pCi/g. After conversion, uranium and radium results are summed and compared to the 5 pCi/g criteria using the NRC's Unity rule as found in 10 CFR Appendix A to Part 40, under I. Technical Criteria, *Criterion 6*, sub criterion (6). After subtracting background (Bkg), all nine (9) soil samples were above the 5 pCi/g Unity rule.

Conversion formula:

$$\text{mg/Kg} \cdot \text{Kg}/1\text{E}6\text{mg} \cdot 6.77\text{E}-7\text{Ci/g} \cdot \text{pCi}/1\text{E}-12 \text{ Ci} = \text{pCi/g}$$

The specific activity of uranium is 6.77E-7 Ci/g as per 10 CFR PART 20, appendix B.

Converting the uranium reported in mg/Kg to pCi/g is accomplished using the above formula.

TABLE 1

Sample ID	Uranium mg/kg	Radium pCi/g	Uranium pCi/g	Unity pCi/g	Unity-Bkg pCi/g	MicroR/hr
1	204	27.7	138	165.7	162.2	22
2	86	3.3	58	61.3	57.8	14
3	21.5	2.6	14	16.6	13.1	16
4	47.7	3.5	32.3	35.8	32.3	18
5	31.7	1.6	21.5	23.1	19.6	14
6	204	38.5	138	176.5	173	16
7	13.1	1.9	8.9	10.8	7.3	16
8	72.6	3.7	49.2	52.9	49.4	14
9	109	12.8	13.8	86.6	83.1	17
10 (Bkg)	3.5	1.1	2.4	3.5		17

REMEDIATION PLAN

A Ludlum Model 2221 Scaler/Ratemeter with a 2" sodium **iodide crystal** has been procured for environmental assessments for radionuclides. The meter will respond to gamma radiation in counts per second and the probe will be contained within a hand held portable lead shield. The probe will be positioned approximately 3-4" above the surveyed surface and exposed through an opening in the bottom of the shield. The counts per second will be **accumulated over a period of one minute** and correlated with known pCi/g concentrations to arrive at pCi conversion to be used during the walk over.

The area affected will be fenced off to prevent access as requested by WDEQ until remediation activities commence. The remediation will consist of four phases described below.

Phase I: Soil Surveying

A Health Physics Technician will walk over the impacted area while holding the shielded gamma meter. The walk over survey will be conducted following a grid pattern of parallel lines approximately 10 feet apart over the impacted area. The Technician will begin at a point 2-3 feet outside the delineated release area and position the Ratemeter 3-4" over the surface and determine the pCi concentration. Then the Technician will take one step (2-3 feet) along a straight line, position the Ratemeter 3-4" over the surface, and again determine the pCi concentration. The Technician will then take another step and determine the next reading. This process will continue in a straight line until a reading is taken beyond the delineated release area as depicted on the map. The Technician will then repeat the process on a parallel line approximately 10 feet away. The walk over survey will be completed once all the separate impacted areas as delineated on the map have been surveyed. See attached map demonstrating 10 foot parallel grid lines over the entire impacted area as an example. Actual survey lines used will vary to match up with the separate delineated areas.

The background Unity value will be subtracted from the reading displayed by the Ratemeter to determine the net pCi at a given point. Values over the 5 pCi conversion will be flagged for removal.

Phase II: Soil Removal

Header house 15-20 will be shut down during the removal operation. A 770CH-John Deere small profile grader together with a backhoe frontend loader will be used to remove the flagged soil from the impacted area and load directly to approved DOT IP-1 11(e) 2 byproduct containers. Areas flagged around the well heads will require hand shovel removal and will be placed onto nearby flagged areas. The grader will lay over 2-5" of flagged soil depending on the irregularity of the surface for removal by the loader. The freshly cut area is ready to re-survey to determine if more depth of soil is to be removed. A loader will remove laid over soil to approved DOT IP-1 11(e) 2 byproduct container(s) staged adjacent to the area on top of barrier liners. The barrier liners will capture loose soil that fall from the loading operation. The loose soil will be hand shoveled into the container. Once containers are loaded they will be shipped using site procedures complying with DOT regulations to an NRC approved 11 (e) 2 by-product disposal facility.

Phase III: Re-surveying

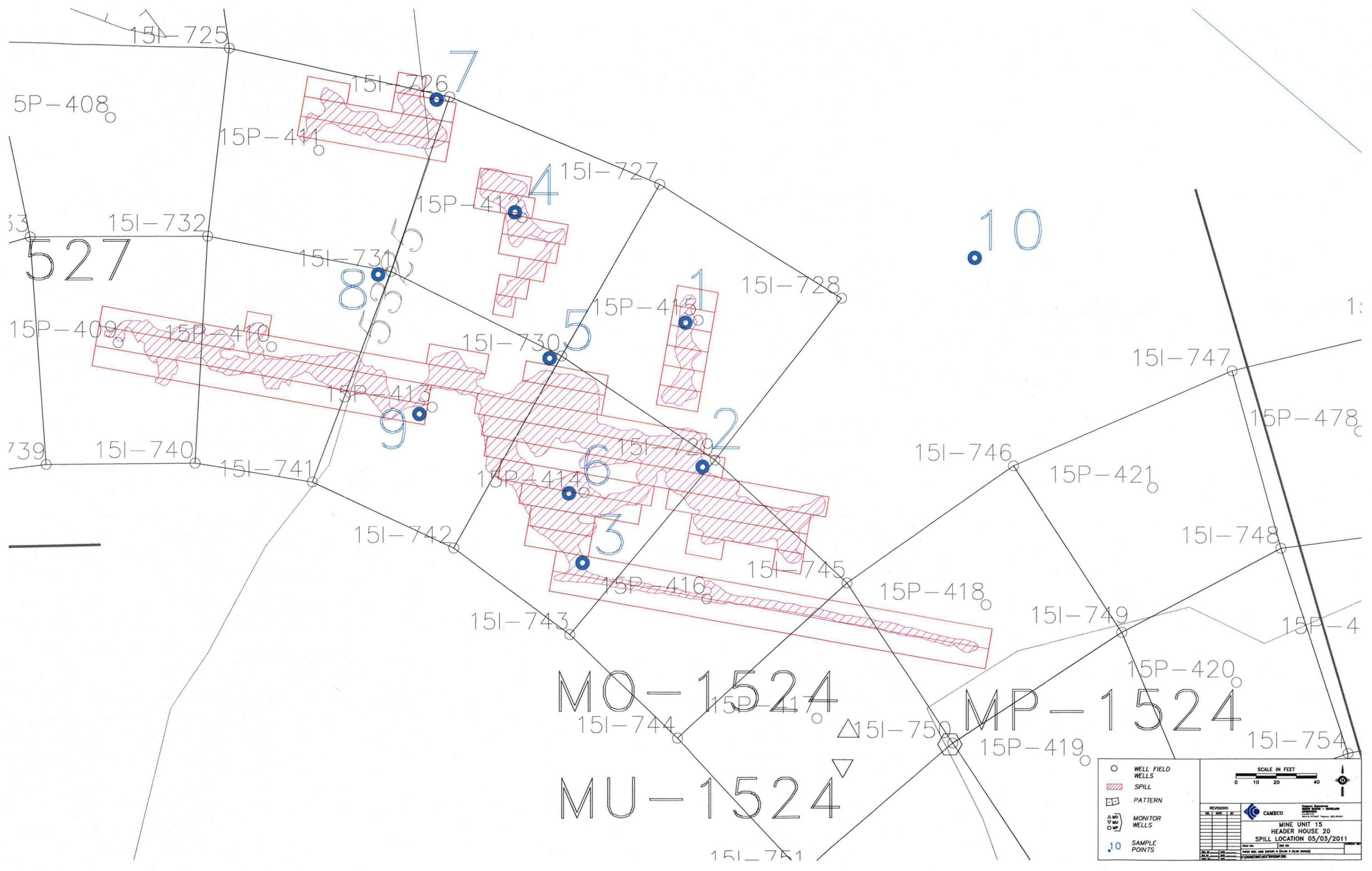
The above procedures described in Phase I and II will be repeated in the areas that had soil removed until the walkover gamma readings are within acceptable range.

Phase IV: Surface reclamation

Once all of the removed soil is all loaded to containers the areas that had soil removed will be mulched and drill seeded. The perimeter of the disturbed area of soil removal will have erosion and sedimentation controls installed until vegetation is established.

PLAN CONTINGENCIES

The remediation plan is contingent upon WDEQ/LQD approval according to the draft 'Tracking Sheets for Commitments & Deadlines for Compliance' provided to Cameco on August 24, 2011. The estimated time frame to complete the remediation once Phase I begins will depend on issues of weather, how equipment/personnel may be needed elsewhere, and arrangements to bring in approved DOT IP-1 11(e) 2 byproduct containers in a timely manner. Cameco's expectation is that WDEQ/LQD approval can be obtained expeditiously so that the remediation may begin in October, 2011.



○	WELL FIELD WELLS
▨	SPILL
□	PATTERN
△	MONITOR WELLS
●	SAMPLE POINTS

SCALE IN FEET
0 10 20 40

REVISIONS

NO.	DATE	BY	DESCRIPTION

CAMECO
MINE UNIT 15
HEADER HOUSE 20
SPILL LOCATION 05/03/2011