DEPARTMENT OF ECOLOGY
State of Washington

Responsiveness Summary Report

November 16, 2018 Public Meeting, Agreed Order, and Public Participation Plan

For

Reserve Silica Reclamation Site
26000 Black Diamond-Ravensdale Road
Ravensdale, WA 98051

Prepared by

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Introduction

The Department of Ecology (Ecology) and potentially liable persons (PLPs)[1] Reserve Silica Corporation (Reserve Silica) and Holcim (US) Inc. (Holcim) held a public meeting on November 16, 2018, to discuss the status and planned remediation approach for the Reserve Silica Corporation site. Ecology held a 30-day public comment period (November 5th through December 7th 2018) on the draft Agreed Order (AO) and Public Participation Plan (PPP). **This Responsiveness Summary addresses the draft Agreed Order; reference the draft AO (Attachment 1) when reviewing the comments below.**

The draft Agreed Order stipulated that the PLPs prepare a Remedial Investigation (RI) and Feasibility Study (FS) for the site, in accordance with WAC 173-340-350 and Ecology Publication Numbers 16-09-006 (Remedial Investigation Checklist) and 16-09-007 (Feasibility Study Checklist). Ecology requests the RI and FS be prepared as separate documents. The RI should be a comprehensive document for the site that describes the history, previous environmental investigations, previous and ongoing cleanup actions, additional characterization, and Conceptual Site Model for the site. The RI should include sufficient detail to develop and evaluate cleanup alternatives in the subsequent FS report. The approved RI will define the site boundary, the chemicals of concern (COCs), and the cleanup standards for the Site. The PLPs are encouraged to consider the public comments during the development of the Reserve Silica Reclamation site RI Work Plan (RI Work Plan) and the RI report.

Ecology categorized the public comments as public participation, site definition, groundwater hydrology, chemicals of potential concern (COPCs), seismic concerns, and treatment system comments. Ecology's expectations and response to these comments are described in the following sections.

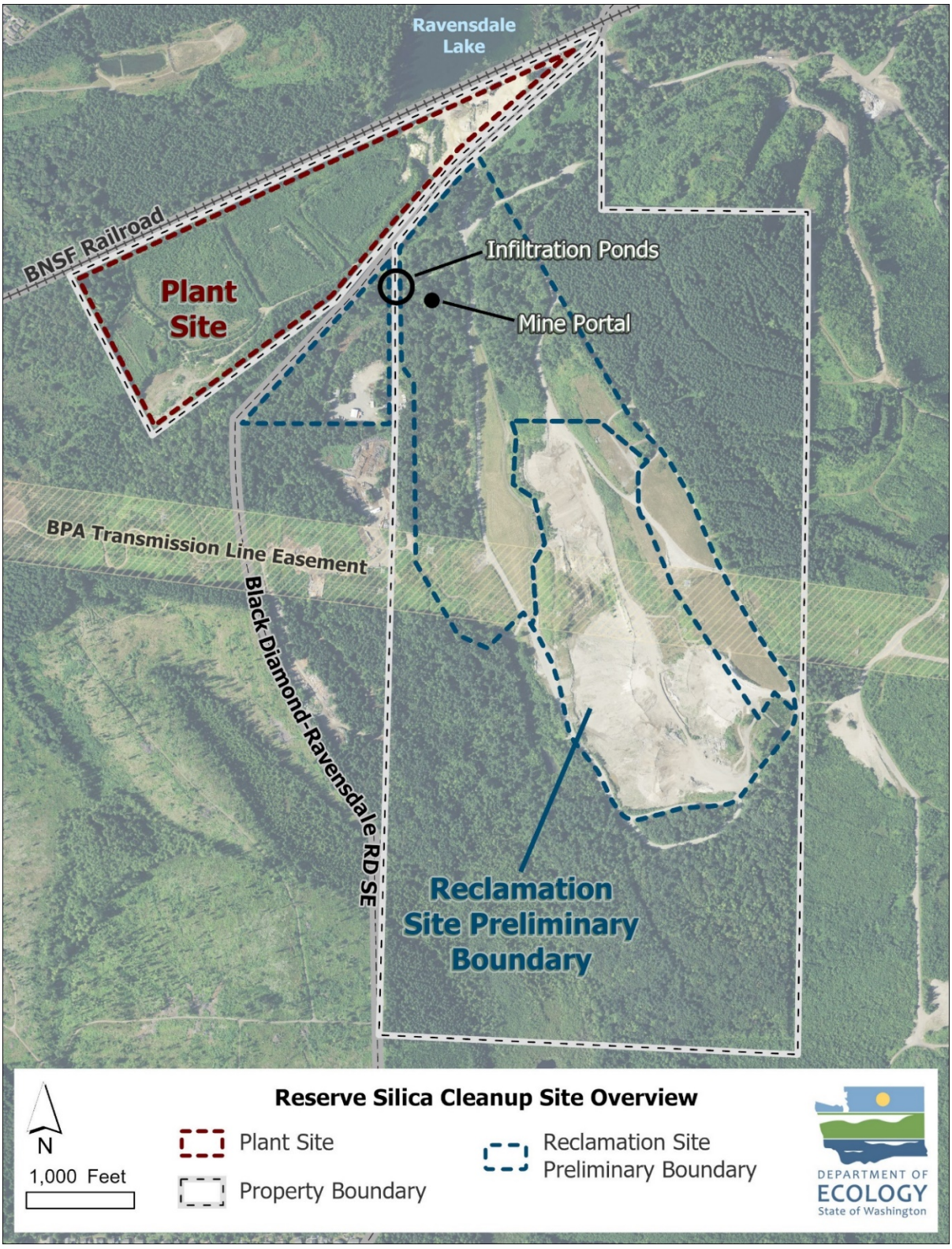
Status Update on Site Separation

Reserve Silica and Holcim entered into an Agreed Order with Ecology on December 16, 2019 for the investigation and cleanup of contamination on the Reserve Silica Reclamation site in accordance with Model Toxics Control Act (MTCA). The Reserve Silica Corporation site was renamed as the Reserve Silica Reclamation site (Facility/Site ID 2041, Cleanup Site ID 4728, website: https://fortress.wa.gov/ecy/gsp/Sitepage.aspx?csid=4728) on November 18, 2019.

The Reserve Silica Plant site (Facility/Site ID 19532, Cleanup Site ID 15125, website: https://fortress.wa.gov/ecy/gsp/Sitepage.aspx?csid=19532) was identified as a new site on November 18, 2019 and listed on the Confirmed and Suspected Contaminated Sites List on December 24, 2019. Reserve Silica plans to independently investigate and cleanup the Reserve Silica Plant site in accordance with MTCA. Discussion of the site separation are discussed below.

[1] On March 5, 2018, Ecology determined that BNSF Railway is also a PLP for the site, but BNSF Railway has declined to participate in the implementation of this Agreed Order.

The current site configuration for the Reserve Silica Plant Site and Reserve Silica Reclamation Site is below.



Public Participation Comments

Ecology intends to allow public review of the RI Work Plan, and hold formal public comment periods for the RI and the FS. The Draft Cleanup Action Plan (DCAP) will also undergo a public comment period. However, the scope of work under this Agreed Order covers the RI/FS activities up to and including submittal of the Agency Review Preliminary DCAP to Ecology. The DCAP public comment period will occur after the work of this Agreed Order is complete.

Ecology will receive quarterly progress reports and will update the public by providing periodic brief oral presentations at regularly scheduled Greater Maple Valley Unincorporated Area Council (GMVUAC) meetings or upon request.

Public comment 1: GMVUAC Comment 3 (Attachment 5)
The Draft Agreed Order and Public Participation Plan should be amended to include a required public comment period regarding and relating to the forthcoming Work Plan, so that members of the Public have an opportunity to review and comment on it before it is implemented as part of the RI/Feasibility Study.

To ensure the Public Participation Plan includes public notice and an opportunity for the public to submit comments to Ecology on the draft Work Plan before it is finalized, we suggest the following modified excerpt from Ecology's November 30, 2018, e-mail be included in the final Public Participation Plan:

> "The proposed RI Work Plan will be made available to the public for review and comment before it is finalized and implemented. Because Work Plans are generally not subject to formal public review and comment, in addition to posting notice on its Document Repository for Reserve Silica Corporation website the Department will send a Notice of Draft Work Plan Availability to only those individuals and entities who have submitted written comments on the Draft Agreed Order and/or Public Participation Plan. The Department will consider all public comments received and appropriately include such comments in the final Work Plan."

We wish to continue an open dialogue with Ecology officials on Reserve Silica Site cleanup. Thank you in advance for your careful consideration of our comments.

> ***Ecology response to Public comment 1:***
> Ecology revised the Public Participation Plan by adding the following paragraphs under the heading "Public comment periods":
>
> "Ecology will send a notice of availability of the Remedial Investigation Work Plan to those individuals who submitted written comments on the Draft Agreed Order or Public Participation Plan. The Remedial Investigation Work Plan will be made available to the public for a two-week period for review and comment before it is implemented.
>
> Notice of its availability will be posted on the Site webpage and the document will be added to the Document Repository for the Reserve Silica Reclamation Site, accessible

through the Site webpage. Ecology will consider all comments received. Ecology does not plan to provide a responsiveness summary for the RI Work Plan comments."

Public comment 2: Brathovde Comment 12 (Attachment 2)

Agreed Order, Exhibit B (Task 1 RI Work Plan) – It appears the RI Workplan is where many of the issues/questions mentioned above will be addressed. And this Work Plan will dictate the scope and content of the RI and the Feasibility Study (FS). This Workplan also addresses many of the underpinnings of this issue (site history; past investigations; conceptual site model; geology and groundwater characteristics; past, current and future land use; nature and extent of contamination; ecological receptors; etc.). Many of these topics have been seriously misrepresented in past communications from Reserve. As such, this Workplan is crucial to the success of this Remedial Action and this AO. As such, it is very important that the public be provided an opportunity to comment on the RI Workplan - before it is finalized.

Ecology response to Public comment 2:

The Remedial Investigation Work Plan will be made available to the public for a two-week period for review and comment.

Public comment 3: Brathovde Comment 14 (Attachment 2)

Agreed Order, Exhibit B; (Task 2, RI); para 6 – It is stated, "The RI Report will not be considered Final until after a public review and comment period." But the Schedule of Deliverables in Exhibit B (page 9/9) indicates "Public comment periods for the Draft RI and Draft FS Reports can be combined." However, Ecology has indicated that this schedule implies the Draft FS Report is not expected until early 2021 – more than two years into the project! If public input is truly going to be considered in this process, it is important that the public have an opportunity to: (a) comment on the RI Workplan – before the RI Field Work has progressed substantially; (b) comment on the RI – before the Agency Review Draft FS is submitted; and (c) comment on the Public Review Draft FS Report – before the Agency Review Draft Cleanup Action Plan is submitted. Waiting for two years to solicit additional public review and comment does not "promote meaningful community involvement," nor "encourage the public to learn about and get involved in decision-making opportunities" in this effort – key goals of the Public Participation Plan.

Ecology response to Public comment 3:

There will be separate comment periods for the draft RI and the draft FS report.

Public comment 4: Brathovde Comment 15 (Attachment 2)

Agreed Order, Exhibit B; (Task 6, Public Participation); para 1 – "The PLP's shall support Ecology in presenting the Public Review Draft RI Report and the Public Review Draft FS Reports and SEPA evaluations **at one public meeting** or hearing." [bold emphasis added]. As mentioned above, waiting to solicit public comment until the Public Review Draft FS Report is finalized – two years into the project, fails to meet Ecology's goals for Public Participation in this effort; and risks either (a) wasting a lot of effort that has to be re-done once public input deemed to be material to this issue has been received; or (b) ignoring public input because too much time and effort has already been expended in conflict with public input of a material nature. The public should be provided a review/comment opportunity at each stage in the process

- as soon as Ecology input has been incorporated into: (1) the draft RI Workplan; (2) the draft RI; (3) the draft FS; (4) any SEPA checklist or environmental impact statement; (5) any substantive Interim Action Plans; and (6) the Responsiveness Summary report. Note that formal public meetings are not likely necessary at each stage, but a notification and a formal public comment period should be provided.

Ecology response to Public comment 4:
The Remedial Investigation Work Plan will be available for public review and comment for two-weeks. Ecology will provide a formal 30-day comment period for the Draft RI, Draft FS, and Draft Cleanup Action Plan (CAP). Ecology will provide a responsiveness summary letter for formal comment periods. A public review and comment period will be held for the Draft Interim Action Work Plan if it is determined that an interim action is necessary. State Environmental Policy Act (SEPA) evaluations will be performed for the Draft CAP and the Interim Action Work Plan, as warranted, and the PLPs will prepare an environmental impact statement if Ecology finds a determination of significance for the proposed action. SEPA evaluations include a public comment period. Ecology plans to provide periodic presentations about the project status at regularly scheduled GMVUAC meetings.

Public comment 5: Brathovde Comment 16 (Attachment 2)
Agreed Order, Exhibit B; (Task 7, Preliminary Draft Cleanup Action Plan); last para – AO calls for a Public Review DCAP, but Schedule of Deliverables does not show a public review/ comment period for DCAP. Final adoption of the CAP should reflect public review/comment.

Ecology response to Public comment 5:
The Draft Cleanup Action Plan (CAP) will undergo a public comment period. However, the scope of work under this Agreed Order covers the RI/FS activities up to and including submitting the Agency Review Preliminary DCAP to Ecology. The DCAP public comment period will occur after the work of this Agreed Order is complete.

Public comment 6: Brathovde Comment 10 (Attachment 2)
Agreed Order, Sec VII (Work To Be Performed), #B; pg. 11 – Will quarterly reports and associated AO submittals (including RI Workplan) be entered on the Environmental Information Management System (EIM), and available for public monitoring?

Ecology response to Public comment 6:
Toxics Cleanup Program Policy 840 (Data Submittal Requirements) requires that environmental monitoring data collected during MTCA site investigations and cleanups should be submitted to the EIM database concurrent with the submission of project reports. The EIM database is a numerical database used to store environmental monitoring data. However, the Ecology site manager has the discretion to post project documents to the Document Storage and Retrieval System (DSARS) to allow public assess through Ecology's website at https://fortress.wa.gov/ecy/gsp/Sitepage.aspx?csid=4728. Regarding the work under this Agreed Order, Ecology plans to post to the DSARS the quarterly reports, the draft and final RI Work Plan, the draft and final RI Report, and the draft and final FS report.

Liability Comment

Ecology issued final determination of liability letters to Reserve Silica Corporation and to Holcim (US) Inc. on September 5, 2017, and to BNSF Railway on March 5, 2018.

***Public comment 7*: Brathovde Comment 3 (Attachment 2)**
Agreed Order, Sec IV, #C (PLP's); pg. 5 - Given that BNSF Railway was identified as a Potentially Liable Party (PLP) in this case, and yet has declined to participate in this Agreed Order, are they still considered a PLP? And would they still be held liable to assist with any agreed Cleanup Action Plan?

> ***Ecology response to Public comment 7:***
> BNSF's non-participation in the Agreed Order does not release them of liability.

Site Definition Comments

The potential site boundary has been described in several documents:

- The Site Hazard Assessment (SHA, Ecology, January 25, 2016) identified three parcels owned by Reserve Silica (012106-9002, 362206-9065, and 352206-9018) and one parcel owned by Baja Properties (352206-9046).
- Reserve Silica re-parceled 012106-9002 and 362206-9065 in 2017, creating the current parcels owned by Reserve Silica (012106-9002, 012206-9010, 012106-9011, 012106-9012, and 362206-9065) and one parcel owned by Ravensdale 6 LLC (362206-9138). Parcel 362206-9138 was conveyed from Reserve Silica Corporation to Ravensdale 6 LLC, a wholly owned subsidiary of Reserve Industries, in a Statutory Warranty Deed dated November 21, 2017, that was filed with King County. The Ravensdale 6 LLC parcel contains the Dale Strip Pit and Lower Disposal Area.
- Aspect Consulting, LLC (Aspect) submitted an RI report (Aspect, November 21, 2017) on behalf of Reserve Silica Corporation that identified the new parcels, and expressed the intent of reducing the number of parcels in the site.
- Ecology determined that "the characterization of the site was not sufficient to make a determination as to the full areal extent of contamination from release of hazardous substances at the site" (Ecology letter to Marisa Floyd, January 12, 2018).
- Ecology submitted a data gaps memorandum on January 30, 2018 that lists investigation data gaps for seven parcels.
- Aspect submitted an Investigation Data Gaps Work Plan to Ecology on July 26, 2018. The Work Plan addresses the Plant site and lower haul road on the Reclamation site, but deferred cement kiln dust (CKD) related data gaps until the Agreed Order was negotiated.
- On behalf of Reserve Silica, Aspect submitted a technical memorandum letter to Ecology on September 4, 2018 to justify the elimination of four parcels (362206-9065, 012106-9010, 012106-9002, and 012106-9012) from the se during the negotiation of the Agreed Order.
- The draft Agreed Order states that the site is generally located on parcels 352206-9018 (plant site), 362206-9138 (CKD disposal areas), 012106-9011 (inert waste disposal

areas), and 352206-9046 (Baja Properties). Under MTCA (WAC 173-340-200), the site is defined by where a hazardous substance other than a consumer product in consumer use has been deposited, stored, disposed, placed, or otherwise come to be located. The Agreed Order states that the site boundaries will be delineated following completion of the RI conducted under the Order and approved by Ecology.

- Ecology discussed the public comments from the November 16, 2018, public meeting with the PLPs on January 9, 2019. Ecology requested and received historical photographs and documentation related to coal processing at the plant site from Michael Brathovde in emails on January 28 and 30, 2019.
- Reserve Silica submitted a letter to Ecology dated February 27, 2019, that addressed historical coal processing at the plant site, the independent cleanup of the plant site, and commenter speculation that CKD-fertilizers may have been used at the site.
- Ecology issued a letter to the PLPs on June 27, 2019, in which Ecology provided its conclusion that the hazardous substance releases at the plant site constitute a separate site from the CKD-impacted area to be addressed in the agreed order, and provided Ecology's opinion on commenter speculation that CKD fertilizer may have been used on land near the landfills.
- The Reserve Silica Corporation site was renamed as the Reserve Silica Reclamation site (Facility/Site ID 2041, Cleanup Site ID 4728).
- Reserve Silica and Holcim entered into an Agreed Order with Ecology on December 16, 2019 for the investigation and cleanup of contamination on the Reserve Silica Reclamation site in accordance with Model Toxics Control Act (MTCA).
- The Reserve Silica Plant site (Facility/Site ID 19532, Cleanup Site ID 15125) was identified as a new site on November 18, 2019 and listed on the Confirmed and Suspected Contaminated Sites List on December 24, 2019.

Basis for Ecology's Determination That the Former Plant Site is a Separate Site

Ecology's conclusion that it is appropriate to consider the former coal and sand processing plant area to be a separate site or "facility" from the areas impacted by leachate from the cement kiln dust (CKD) landfills is based on the following considerations:

- The sources and types of contamination are distinct, and the contamination areas do not overlap. There is no indication at this time that CKD-impacted groundwater extends to the plant facility parcel, nor is there any indication that hazardous substance releases from the former plant facility extends to the landfill-impacted area.
- Public Health – Seattle & King County (Public Health) issues a post-closure landfill permit for the limited purpose landfills on parcel 362206-9138 (Lot 6) that were closed under chapter 173-301 WAC (Lower Disposal Area) and chapter 173-304 WAC (Dale Strip Pit). PHSKC currently issues an inert waste landfill permit for the active landfills on parcel 012106-9011 (Lot 5) under chapter 173-350 WAC. A post-closure landfill permit will be maintained on this site until applicable functional stability or MTCA compliance is demonstrated, with applicable long-term post-closure care and environmental covenant requirements. In contrast, the cleanup of the Plant site will be performed in accordance with MTCA. Short-term cleanup alternatives are anticipated.
- The PLPs have reasonably proposed separate RI and FS reports for the landfill area and the Plant site. The RI for the landfill-impacted area will likely involve a staged evaluation of the complex hydrogeology impacting groundwater flow and CKD seepage. The FS will be developed with consideration of the operation, evaluation, and continual improvement of independent and interim cleanup actions. An expedited cleanup schedule for the Plant site is anticipated and preferred.
- The landfill-impacted areas present a higher risk than the hazardous substance releases known to have occurred at the Plant site.

Reserve Silica and Holcim entered into an Agreed Order with Ecology on December 16, 2019 for the investigation and cleanup of contamination on the Reserve Silica Reclamation site in accordance with MTCA. Reserve Silica plans to independently investigate and cleanup the Reserve Silica Plant site in accordance with MTCA.

Public comment 8: Brathovde Comment 2 (Attachment 2)

The AO suggests that the "Preliminary Site" for investigation is limited to Lot 6 (CKD Landfill), Lot 5 (Inert Waste Landfill), the Plant Site lot, and the Baja-owned parcel. This definition appears to have been taken directly from the technical memorandum submitted by Aspect Consulting, dated Sept 4, 2018; and is primarily driven by the CKD and CKD-leachate issue. We believe that for purposes of the Remedial Investigation (RI), the MTCA "Site" should remain the entire property. At minimum, the "Preliminary Site" should include the four parcels proposed by Aspect (Lots 5, 6, Plant Site and Baja parcels), as well as the north part of Lot 1, the east parts of Lots 3 and 4, and the northernmost thin strip of Lot 4. Please refer to our public comments on Aspect's technical memorandum on Site definition (separate submittal) for our rationale for proposing this broader definition of the "Preliminary Site" for the RI.

See *Ecology response to Public comments 8 and 9* below.

Public Comment 9: Brathovde Comment 1 (Attachment 3)

Besides the potential Plant Site contaminants tested for in the RI, and CKD and ASARCO slag-related contamination, there are three other suspected contaminate risks that, it would seem, should be investigated as part of the RI, to determine the MTCA "Site" on the Property. These risk areas are (1) the Dale Coal Company coal processing site in the north of Lot 6; (2) the coal tailings pile in the north of Lot 1; and (3) the possible application of industrial-waste "fertilizer" products on the Property, especially on the eastern portion of Lot 3.

Ecology response to Public Comments 8 and 9:

Reserve Silica plans to independently clean up releases of hazardous substances at the Plant site parcel as a separate site in accordance with MTCA. The Agreed Order does not address the Reserve Silica Plant site.

The Agreed Order applies to the Reserve Silica Reclamation site and addresses the landfill-impacted areas on the south side of Black Diamond-Ravensdale Road. Under the Agreed Order, the RI should address CKD-related surface water and groundwater impacts and any collocated or adjacent hazardous substance releases associated with historical mining activity. Although Dale Coal Company may have operated facilities on the landfill-impacted parcels, the residual coal tailings appear to be impounded on the plant site parcel and potentially beneath Black Diamond-Ravensdale Road, which was constructed after May 1941 (see *Ecology response to Public comments 11 and 12*).

Ecology found no credible evidence that CKD-fertilizer was applied on land in the vicinity of the site (See *Ecology response to Public comment 10*).

The RI will need to collect data necessary to fully characterize the nature and extent of contamination. It must also develop and evaluate cleanup action alternatives on the landfill-impacted areas that are identified in the RI Work Plan, without limitation to any particular parcels or property ownership. The RI activities under the Agreed Order are not limited to parcels 362206-9138 (CKD disposal areas), 012106-9011 (inert waste disposal areas), and 352206-9046 (Baja Properties).

Public comment 10: Brathovde Comment 4 (Attachment 1)

Lot 3 Data Gap (012106-9002) – As described in our January 9, 2018 comments on Reserve's independent RI, we feel the eastern portion of this lot should be tested for hazardous substances associated with industrial waste "fertilizers" (e.g., Cal-Mag, Ag Mag and Al Mag) and CKD-based liming agents. Use of these hazardous waste "products" were being aggressively promoted by Reserve Industries (L-Bar Products), their predecessor (Industrial Mineral Products – IMP), and by Holnam (predecessor of Holcim; and generator of the CKD dumped at Ravensdale) in the early sand-mining days of this property; and could explain the unusual state of the current forest growing on this lot. Any contamination on this Lot also has the potential to impact the adjacent Lake Sonia wetland complex, and Lot 4.

Ecology response to Public comment 10:

On behalf of Reserve Silica, Aspect Consulting on February 27, 2019, responded to the alleged application of CKD fertilizer at the site, and provided the two forestry reports (International Forestry Consultants, 2012 and American Forest Management, 2016) to Ecology for review. Aspect reports that the transportation of CKD fertilizer from Chewelah, Washington to the site (320 miles) would be cost-prohibitive and the application of CKD fertilizer would be impracticable on the steep slopes of Lot 3. Aspect attributed the discrepancy in the aerial photography to seasonal variability of foliage.

Ecology reviewed the two forest resource management reports. The forestry reports indicate that Lots 3 and 4 are remote and would have high management costs, and that the steeper soil on the eastern side of Lot 3 is poorly suited for soil treatment. The remaining soil, according to the reports, would be expected to have high seedling mortality because of high moisture content. The forested and wetland soils in Lots 3 and 4 do not appear suitable for soil treatment with CKD fertilizer.

Ecology found no credible evidence that CKD products were applied as fertilizer at the site. Ecology does not recommend sampling to evaluate speculation about the use of CKD fertilizers because the application of CKD fertilizer is improbable. Additionally, CKD fertilizers are used as a soil conditioner to reduce soil acidity, which would stabilize natural metal concentrations in soil.

Public comment 11*: *Brathovde Comment 4 (Attachment 2)

Agreed Order, Sec V (Findings of Fact), #A; pg. 5 – Historical documents show that extensive coal processing also occurred on parcels -9138 (Lot 6), -9065 (Lot 1), and -9046 (Baja).

See Ecology response to Public comments 11 and 12 below.

Public comment 12: Brathovde Comment 6 (Attachment 1)

Lot 6 & Lot 1 (& Baja parcel) Data Gap *(January 30, 2018 memorandum)* – The northern portions of these three lots along the Ravensdale-Black Diamond Road accommodated an extensive industrial coal processing complex from 1926 until demolished in 1955. Besides the usual coal washing, sorting and storage facilities, this complex also included multiple rail spurs, a forge, machine shops, blacksmith shops, oil house, powder house, sulfur storage building, generator house, boilers and a briquetting plant - among other facilities. We have a map showing the location of these facilities we would be happy to provide Ecology. It would seem, given practices common in the 1920's – 1950's, there is a very high likelihood hazardous wastes were "deposited, stored, disposed of, or placed, or otherwise come to be located" on the industrial processing portions of these lots. It would seem these areas should be tested for hazardous wastes commonly associated with these kinds of operations during this time period.

***Ecology response to Public Comments 11 and 12*:**

Ecology requested and received additional photographs and documentation from Michael Brathovde on January 28 and 30, 2019. These are included as Attachment 9. Ecology reviewed historical coal mining resources (see Attachment 8) and draws the following conclusions:

- Coal preparation facilities were located near the current Black Diamond-Ravensdale Road beginning around 1924. The current railroad line pre-exists coal mining and preparation activities, and the current alignment of Black Diamond-Ravensdale Road is shown on construction plans dated May 1941.
- Map K56_D (see Attachment 8) shows Ravensdale Lake (aka Beaver Lake), the railroad line, a former railroad spur potentially underlying the current Black Diamond-Ravensdale Road, a washery and tipple located on current Lot 1 on the south side of the railroad spur, and a "surface tram to washery" that extends from the washery and tipple to both the Dale tunnel and Ravensdale No. 2 Mine/McKay Workings in 1936. Map K60_G (see Attachment 8) shows that coal from Ravensdale No. 2 Mine/McKay Workings and the New McKay mine were conveyed to a "New Cleaning Plant" in Ravensdale in 1940.
- The May 1941 construction plans provided by Michael Brathovde show the proximity of the coal preparation facilities and railroad spur to the current alignment of the Black Diamond-Ravensdale Road.
- Coal preparation facilities were located on parcel 352206-9018 (aka plant site), parcel 362206-9065 (aka Lot 1), the intermediate Black Diamond-Ravensdale Road property, and likely extend to parcel 362206-9138 (aka Lot 6).

Tailings from coal preparation were deposited south of the pre-existing railroad in low areas that potentially extend under the current Black Diamond-Ravensdale Road. The tailings appear to be impounded primarily, if not exclusively, on the plant site parcel. Coal tailings were encountered from 20 to 30 feet below ground surface and are underlain by recent lacustrine deposits in boring AMW-1 on the plant site parcel. A 4- to 6-foot layer of tailings was encountered above recent lacustrine soil within 10 feet of the surface in borings AMW-2, AMW-3, and AB-1 through AB-4 on the plant site parcel. Based on a review of Resource Protection Well Reports, the tailings do not appear to extend to the south side of Black Diamond-Ravensdale Road in borings MW-1A, MW-2A, MW-5A, and MW-6A adjacent to the infiltration pond on the Baja Property (parcel 352206-9046) and Lot 6 (parcel 362206-9138). The groundwater sampling results from April 6, 2017, do not indicate that hazardous substances were released from coal tailings to the underlying groundwater.

The independent RI (Aspect Consulting, November 2017) identified credible evidence of releases near two former sand processing areas:

- Petroleum hydrocarbons were detected near the 10,000 gallon diesel fuel underground storage tank.
- Petroleum hydrocarbons were detected near former aboveground storage tanks near a hazardous materials storage area.

There is no indication that CKD-impacted groundwater extends to the Plant site parcel, nor any indication that releases of hazardous substances from the Plant site parcel extend to the landfill impacted parcels. Consequently and for purposes of MTCA, Ecology has concluded that the Plant site is a separate site from the CKD-impacted areas to be

addressed under the formal agreed order process. Reserve Silica plans to independently clean up the Plant site parcel as a separate site under MTCA.

Public comment 13: Brathovde Comment 7 (Attachment 2)
Agreed Order, Sec V (Findings of Fact), #O; pg. 9 – While Reserve's independent RI assessed some of the property outside of the "areas known or suspected to be affected by releases from the LDA and DSP", this testing was extremely limited, and did NOT include many areas suspected of containing COCs (e.g., north part of Lot 1; east parts of Lots 3 & 4; majority of lower haul road or any of the other property roads; west portion of plant site). These should all be tested as part of the RI.

> ***Ecology response to Public comment 13:***
> The RI will evaluate potential contaminant source areas, COPCs, and the nature and extent of contamination in the landfill-impacted area. The Plant site parcel is excluded from the Agreed Order.

Public comment 14: Brathovde Comment 8 (Attachment 2)
Agreed Order, Sec VI (Ecology Determinations), #C; pg. 9 – We agree the "Site" should be defined based on findings from the RI under this AO (not the independent RI commissioned by Reserve). But we again emphasize that this RI should address other likely COCs (besides CKD-related pH, arsenic and lead), and should cover testing of the property beyond what the draft AO identifies as the "Preliminary Site." This testing should be clearly defined in the RI Workplan.

> ***Ecology response to Public comment 14:***
> Under the Agreed Order, the RI will evaluate chemical of potential concerns for the potential source areas to facilitate site delineation in the landfill-impacted area. Reserve Silica plans to independently cleanup the Plant site parcel as a separate site under MTCA.

Public comment 15: Brathovde Comment 9 (Attachment 2)
Agreed Order, Sec VII (Work To Be Performed), Intro, pg. 10 & #A pg. 11– Note that the "Site" has not yet been identified. But Exhibit A, "Preliminary Site Diagram" tends to imply that the RI, FS, and DCAP will be limited to Lots 5, 6, plant site, and Baja parcels. We suggest that this section of the AO re-emphasize that the "Site" will be determined based on the RI, and that Exhibit A be revised to indicate the entire property, including the Baja parcel, be included in the "Preliminary Site" for RI study.

> ***Ecology response to Public comment 15:***
> The draft Agreed Order explicitly states that the site will be delineated by the results of the RI conducted under the Order and approved by Ecology. For this reason, the title of Exhibit A is *Preliminary* Site Diagram. The Agreed Order and its Exhibit A have been revised to exclude the Plant site parcel, which will be cleaned up independently as a separate site under MTCA.

Public comment 16: Brathovde Comment 11 (Attachment 2)
Agreed Order, Exhibit A (Preliminary Site Diagram) – As indicated above, this definition of "Preliminary Site," proposed by Reserve/Aspect, tends to imply that the RI, FS, and DCAP associated with this AO will be limited to the areas outlined in red. Such a limitation could preclude or diminish the importance of RI testing of other portions of this property where there is a high probability that toxic contaminants have been "deposited, stored, disposed of, or placed,

or otherwise come to be located." We recommend that the entire property, including the Baja parcel, be included within the "Preliminary Site" definition for this AO. See our public comments on Aspect's technical memorandum on Site definition (separate submittal) for our rationale for proposing this broader definition of the "Preliminary Site". Ultimately, the "Site" for FS and DCAP purposes will then be established based on the results and conclusions from the RI study.

> ***Ecology response to Public comment 16*:**
> The Agreed Order has been revised to exclude the Plant site parcel, which Reserve Silica plans to clean up independently as a separate site under MTCA. However, under the Agreed Order, the RI activities are not limited to parcels 362206-9138 (CKD disposal areas), 012106-9011 (inert waste disposal areas), and 352206-9046 (Baja Properties). The Reserve Silica Reclamation site boundary will be defined by the results of the Ecology-approved RI after public comment.

Public comment 17*: *Brathovde Comment 13 (Attachment 2)
Agreed Order, Exhibit B; (Task 2, RI); para 1 – "The RI must provide sufficient data and information to define the nature and extent of contamination." We fully agree – and note that this must include likely contaminants besides those already being tested for in CKD leachate, and areas outside the "Preliminary Site" boundaries currently specified in this draft AO.

> ***Ecology response to Public comment 17*:**
> The RI will evaluate chemical of potential concerns for the potential source areas in the landfill-impacted area to facilitate site delineation.

Groundwater Hydrology Comments

The complex groundwater hydrology includes surficial and bedrock aquifers that are influenced by dipping coal, shale, siltstone, and sandstone bedrock layers; faults and underground mining works; backfilled surface pits with residual bedrock pillars; and a surficial aquifer with steep topography, interceptor trenches, groundwater divides, and surface water receptors. The RI report should include an Environmental Settings section that provides a comprehensive description of the geology and hydrogeology at the site. The RI report should provide geological and hydrogeological cross-sections and surface expressions that depict the geology; underground mining works and adits; surface mining pits, backfill, and bedrock pillars; topography; interceptor trenches; wells and groundwater levels; and contoured groundwater elevations. These maps should depict potential surface and groundwater migration pathways from the mining works and CKD backfill. The RI report should reference and summarize previous studies, including historical observations, geophysical studies, groundwater tracer studies, and other soil and groundwater sampling investigations. The groundwater investigation should evaluate potential migration pathways and delineate the extent of groundwater impacts from CKD backfill. The groundwater investigation should also evaluate potential impacts of the underground coal workings, including potential discharge of seepage from the Dale Strip Pit through the underground coal workings to the mine portal and the potential hydraulic connection of the underground mine workings to the Lower Disposal Area, for the purpose of developing and evaluating cleanup action alternatives.

Public comment 18: GMVUAC Comment 1 (Attachment 5)

The various reports lack groundwater flow maps, which reflects a lack of widely distributed water level monitoring points. We found just one water-level contour map, which covered only the plant site lot roughly downgradient of the Infiltration Ponds area, in the Nov. 2017 Draft Remedial Investigation (RI). A major goal of the RI should be to develop a robust hydrogeologic conceptual site model, and we believe additional wells (at least piezometers) will be necessary. In particular, an overall understanding of each groundwater flow zone is needed across the site, especially, if any sort of groundwater modeling is contemplated.

There are four major areas of concern where groundwater has been investigated. The Dale Strip Pit has 6 wells, of which 2 are shallow and 4 are in bedrock. Two of the wells are likely upgradient, so that leaves few wells to evaluate impacts to groundwater. The wells are mostly located along a line, which limits the development of reliable groundwater head maps. That said, the bedrock geology here very likely imposes aquifer anisotropy to the extent that groundwater flow is not necessarily perpendicular to head gradient anyway, so it is clear that additional wells would likely be valuable in assessing these effects.

The Lower Disposal Area (LDA) and Infiltration Pond area have similar issues regarding the layout of wells limiting the ability to evaluate groundwater flow directions, both in bedrock (for the LDA) and in the shallow zone. The wells are either mostly along a line or are clustered in a very small area. The Nov. 2017 Draft RI includes wells in the Plant Area that were not evaluated in Ecology's 2016 Site Hazard Assessment, even though one exceeded the MTCA Method B arsenic level, albeit just barely.

We find no information in the various reports as to how wells were sampled or how the samples were handled, both of which can have a large effect on inorganics concentrations. This is typically included in sampling and analysis plan sections of work plans, but should be summarized in the reports where chemical data is presented.

We have seen logs for at least the shallow zone wells, and they appear to be appropriately screened, although 15-foot screens are a bit longer than the norm.

> ***Ecology response to Public comment 18:***
> The RI Work Plan for the Reclamation site will include a Conceptual Site Model that describes the complex geologic and hydrogeologic setting at the site. A sampling plan will be developed to collect data necessary to fully characterize the nature and extent of contamination and to develop and evaluate cleanup action alternatives in the landfill-impacted area. The RI Work Plan will include one or more Sampling and Analysis Plans (SAP) and a Quality Assurance Project Plans (QAPP) for the PLPs' consultants.

Public comment 19: Brathovde Comment 1 (Attachment 1)

Site-Wide Gap #3 *(January 30, 2018 memorandum)* – The Covington Well Field is also in close proximity to Kent Springs, and downgradient for groundwater flow below the contaminated infiltration ponds. Covington Well Field and Kent Springs are major sources of municipal water for these two cities. City of Kent has been actively involved in the Reserve Silica issues, but we do not know if Covington Water District has any awareness of these issues, or of any potential

risk to their water supply from contaminates on Reserve's property. If they are not involved, Covington Water District should be contacted to provide input on this project.

Ecology response to Public comment 19:
Ecology will require the selection of groundwater cleanup levels that are protective of groundwater beneficial use, but not below natural background concentrations of arsenic in groundwater. The Department of Health maintains a mapping application for Group A and B public water supply wells (https://fortress.wa.gov/doh/swap/index.html).

Public comment 20: Brathovde Comment 3 (Attachment 1)
Plant Site/Former Settling Ponds Gap #10 *(January 30, 2018 memorandum)* – We believe there is a real need for more test wells (besides AMW-1) in the southeast end of this area to better understand the extent of contaminated groundwater flow beyond the infiltration ponds and wells MW-5A and MW-6A. This area would appear to be the most likely pathway for potential contamination of Ravensdale Creek and the downgradient Kent Springs and Covington Well Field municipal water supplies. We feel the MTCA RI process should also test for ASARCO roadbed slag-contamination from years of pumping the wastewater from the truck wheel wash to this settling pond area.

Ecology response to Public comment 20:
Reserve Silica plans to independently clean up releases of hazardous substances at the Plant site parcel as a separate site in accordance with MTCA. Investigations for the Plant site will evaluate the adequacy of the existing monitoring well network to assess the nature and extent of groundwater contamination. Data gaps in the conceptual site model for the Plant site RI will be addressed including the installation and sampling of additional monitoring wells.

Public comment 21: Brathovde Comment 5 (Attachment 1)
Lot 4 Data Gap #2 *(January 30, 2018 memorandum)* – Past studies have documented contaminated surface water flows west of the South Pond and LDA leachate collection/interception structures. It would seem the Powell property (adjacent to Lot 4 and south of the Baja lot) should also be tested for CKD-related contaminants.

Ecology response to Public comment 21:
The Conceptual Site Model, as part of the RI Work Plan, will include analysis of surface water bodies, drainage patterns, and potential hazardous substance migration routes. Data gaps in the conceptual site model will be addressed during the RI, including surface water sampling to adequately characterize the distribution and concentrations of hazardous substances.

Public comment 22: GMVUAC Comment 2 (Attachment 5)
There is insufficient definition of what the Potentially Liable Parties (PLPs) must do to model, validate, analyze, and re-evaluate contaminant flows through various geological layers over time and under various circumstances. We see no feedback mechanisms called for by Ecology to use such modeling to better understand events that may occur over time that were not predicted. In any good system where one wants to understand the physical behaviors occurring, one needs to

continually refine the conceptual model used to predict what could occur, so the why's and how's can be better understood. We don't see any of this called for.

Further, the monitoring, which is called for, is not required to be linked to any of the model work, such that it will not be understood the why's and wherefore's of the monitoring results. This could lead to dead-ends where it will not be known how to fashion a true cleanup plan that will work over time.

How will Ecology be able to understand the behaviors of future contamination flows and why they are occurring and ensure contaminants are contained (or completely removed from the site)?

> ***Ecology response to Public comment 22:***
> The RI Work Plan must include a Conceptual Site Model that describes potential migration pathways of contaminants in all environmental media, including the complex geology and hydrogeological and drainage systems. The Conceptual Site Model will be refined in the RI Report. Groundwater modeling is not required or anticipated as part of the RI, but could be employed if appropriate.

Chemicals of Potential Concern Comments

Potential current and historical contaminant sources at the site include CKD fill, underground coal workings, roadbed slag, and potential historical coal preparation activities on landfill-impacted parcels. The RI should evaluate chemicals of potential concern from these sources and propose chemicals of concern and cleanup levels for the site.

EPA[2] described CKD chemicals of potential concerns (COPCs) in a draft technical document for CKD landfills. The COPCs include antimony, arsenic, barium, beryllium, cadmium, chromium (total), lead, mercury, nickel, selenium, silver, thallium, and vanadium. EPA recommends sampling groundwater for these COPCs when a release from a CKD landfill is suspected. The RI should evaluate pH and the speciation, desorption, and mobilization of natural metals in caustic groundwater. EPA states that "volatile and semi-volatile organic compounds are generally not found in CKD due to the combustion of these compounds at the high temperatures encountered in the kiln. However, generally low concentrations of 2,3,7,8-substituted dioxin (0.5 to 20 parts per trillion) and 2,3,7,8-substituted dibenzofuran (non-detected to 470 parts per trillion) were detected." Thus, the concentrations of dioxin may exceed MTCA Method B soil cleanup levels in the CKD backfill. Although dioxin is presumed to have very limited mobility in groundwater, Ecology recommends that dioxin be analyzed in the most-impacted leachate sample to confirm that the concentration is below groundwater and surface water cleanup levels.

Under oxidizing conditions, the native sulfides within the coal can oxidize and create acidic groundwater, increased sulfate concentrations, and mobilize naturally occurring metals. The COPCs for coal mine drainage include pH, metals, and sulfate. The RI should evaluate the discharge of groundwater from the mine tunnel for potential impacts from historical coal mining

[2] Draft Technical Background Document on Ground Water Controls at CKD Landfills, EPA Office of Solid Waste, June 1998

and CKD fill in the Dale Strip Pit, and to confirm that the discharge is below MTCA cleanup levels.

The COPCs for the roadbed slag include arsenic, lead, copper, cadmium, chromium, and mercury. The RI should summarize previous and additional evaluations of the leaching potential of the roadbed slag under natural and caustic groundwater pH conditions.

Public comment 23: Brathovde Comment 1 (Attachment 2)

The Agreed Order (as well as the Public Participation Plan) focuses almost wholly on pH, arsenic, and lead associated with the CKD and CKD leachate. While we agree this is the major concern, we strongly believe that historic uses of this property imply a high potential for other COCs to have been "deposited, stored, disposed of, or placed, or otherwise come to be located" on this property. We believe the Agreed Order should explicitly note the need to test for these other likely COCs.

> ***Ecology response to Public comment 23:***
> The Agreed Order now applies to the Reserve Silica Reclamation site, which excludes the Plant site parcel. Under the Agreed Order, the RI Work Plan will identify potential sources and chemicals of concern in the landfill-impacted area, develop a Conceptual Site Model, and develop a sampling plan to delineate the nature and extent of contamination and the necessary data to develop and evaluate cleanup action alternatives.
>
> Reserve Silica plans to independently clean up releases of hazardous substances at the Reserve Silica Plant site. The chemicals of concern will be evaluated based upon historic site activities.

Public comment 24: Brathovde Comment 5 (Attachment 2)

Agreed Order, Sec V (Findings of Fact), #C; pg. 5 – Besides pH, arsenic and lead, the US EPA's analysis of CKD dust solids and leachate chemistry also identified CKD as potentially contributing concentrations of thallium, antimony, chromium, total-2,3,7,8-substituted dioxins, and total hexachlorodibenzodioxin (GeoEngineers, Preliminary Environmental Conditions Letter Report to Reserve Silica, Jun 22, 2015). Other studies have shown that when materials such as tires and medical wastes were used as a supplemental fuel source in the cement kilns generating the CKD, as we know occurred at times at the Ideal/Holnam plant that generated the CKD deposited at Ravensdale, extremely carcinogenic dioxins and furans can also be present in the CKD. Given the extremely high toxicity of some of these contaminants, and the high chance that some of these may well be associated with the CKD dumped at Ravensdale, the RI should explicitly test for these contaminants. This is particularly a risk should Reserve succeed in their long standing efforts to convince the County to upzone portions of this property to allow them to construct a housing development on these lands.

> ***Ecology response to Public comment 24:***
> Recommended chemicals of concern for CKD leachate are identified above. Section V.C. of the Agreed Order has been revised to include other hazardous substances in addition to high pH and metals.

***Public comment 25*: GMVUAC Comment 1a (Attachment 5)**

Given the wide variety of site uses over the years, at least initial groundwater and surface water sampling should include the full list of pollutants that may have been disposed on site. It is important to cast a wide net initially to ensure that no important COCs are missed.

> ***Ecology response to Public comment 25*:**
> The RI Work Plan will summarize historical coal and sandstone mining, processing, and reclamation and disposal practices at the Agreed Order site. The associated sampling and analysis plan will describe the sampling procedures and analytical parameters to evaluate potential source areas.

Public comment 26: Brathovde Comment 2 (Attachment 1)

Plant Site Data Gap 3 *(January 30, 2018 memorandum)* – Note, there was a major transformer installation located approximately where the wheel wash is now located in the Dale Coal Company days (1926-1955). We have a map and photo of this installation, if that would be of help to Ecology.

> ***Ecology response to Public comment 26*:**
> Michael Brathovde provided this additional information in emails dated January 28 and 30, 2019. Based on Ecology's review of the map and the May 1941 construction plans provided by Michael Brathovde, the former transformer location is beneath the current alignment of Black Diamond-Ravensdale Road. Ecology encourages the PLPs to evaluate the former location of the transformer during their independent cleanup of the Reserve Silica Plant site.

Public comment 27: GMVUAC Comment 1b (Attachment 5)

Moreover, looking back at Ecology's 2016 Site Hazard Assessment, we believe the analysis of which concentrations found in groundwater exceed MTCA Method B cleanup levels does not include an important issue regarding Manganese. Nor does Manganese appear to have been analyzed in all areas of the site. From Ecology's Cleanup Levels and Risk Calculation's (CLARC's) "Cautions and Limitations" page:

> Manganese — CLARC provides pre-calculated standard Method B or C formula values for manganese. The formula value for manganese depends on the reference dose (RfD). The reference dose was obtained from the U.S. Environmental Protection Agency's Integrated Risk Information System (IRIS), but was not modified as recommended by the EPA. The recommended modification depends on the route of exposure. EPA recommends that a modifying factor of "1" be used when assessing exposure from food and that a modifying factor of "3" should be used when assessing exposure from drinking water or soil. This modification factor is based on the increased exposure of children to manganese-contaminated water and soil. Please consult IRIS for a more complete description of the basis for the modification factors. As noted, the RfD for manganese listed in CLARC and used to pre-calculate the formula values for standard Method B and C has not been adjusted. If the modifying factor of "3" for manganese is used, then the

formula values for standard Method B and C for soil and ground water would be one-third the value presented in CLARC (our emphasis above).

That would make the appropriate Groundwater Method B level for evaluating Manganese in groundwater 747 ug/L instead of 2,240 ug/L. That level has been exceeded on site, so Manganese should be retained as a chemical of concern.

Ecology response to Public comment 27:
The RI Work Plan will need to address whether manganese should be identified as a chemical of potential concern. The PLPs will propose MTCA-compliant cleanup levels in the RI report.

Seismic Comment

Public comment 28: email comment from Hendrick Haynes, Comment 1 (Attachment 6)
I appreciate what the owners of the Reserve Silica Site are doing, and the Washington State Department of Ecology, and wish them well in their efforts. However, significant dangers seem not addressed as related to emergency planning and securing unloading of waste from the site during and following a geological emergency. The site seems located on or near a fault zone, and radiating scarps, which during changes or shifts in geometry may allow pollutants to quickly follow or intrude into unplanned for sites. This could compromise deep aquifers which serve far reaching public water supplies, the shallower depth water supplies of adjacent land owners, and also could contaminate surface water flows of streams, rivers, and lakes (affecting surface flora and fauna). Not to isolate the Reserve Silica Site as the only site of concern, an quick response emergency plan should be available that allows for sealing off of surface leakage zones opened up or created by catastrophic events (including equipment failures, acts of sabotage or misjudgment, etc.), as well as much deeper events as considered above. This would include (naturally) such site having in place sensors and equipment for monitoring seismic activity, flows, and contamination levels at key places, and providing for alarm means for setting in motion emergency measures. Other options may include an ability to do emergency drillings, and the injection of materials to seal off and neutralize the flow(s) of agents into areas of concerns.

Such contingency planning development is not foreign to engineering practice(s). If one has ever flown in an airliner, one may recall the "crash" or "ditching" procedures the passengers are made acquainted with, and this (of course) compliments crew training and the designing in of special systems and hardened structures designed to improve passenger safety.

As you are likely well aware, we do live near a volcano (Mount Rainier), and we do have a near term history of volcano eruptions in this region (1980 eruption of Mount St. Helens). To our north is Mount Baker, and we have other features as well, which would seem to highlight our zone.

You may also note that USGS publishes updates on seismic activity in our area (on the internet) with some frequency, and activity about the Black Diamond - Maple Valley area happens with significant frequency. I live on Cedar Mountain, which is near the town of Maple Valley. It is a

"saddle back" feature which seems separated by a scarp, and low grade seismic activity can be felt by local residents with some frequency. This area is similar to many areas in the region. See USGS for more information.

***Ecology response to Public comment 28*:**
The RI, FS, DCAP, and any interim actions will be performed in accordance with the Model Toxics Control Act. The implementation of the cleanup action may require the preparation of an Engineering Design Report (EDR), in accordance with WAC 173-340-400. The EDR will consider facility-specific characteristics that may impact the cleanup action, including the probability of seismic activity.

Treatment System Comment

Public comment29*: *Brathovde Comment 6 (Attachment 2)
Agreed Order, Sec V (Findings of Fact), #L; pg. 8 – Implementation of this treatment system is very encouraging. Have the testing results indicated success at controlling pH and arsenic? Is the system also expected to control lead or any other COC's known to be associated with CKD? Are monitoring wells MW-5A and MW-6A now indicating no contamination exceeding MTCA standards?

***Ecology response to Public comment 29*:**
The PLPs began operating the seepage treatment system on September 28, 2018. The seepage system uses an ozone sparging system to neutralize the pH and decrease the concentrations of arsenic and lead. Iron filings are used as a secondary treatment process to remove residual arsenic concentrations from the treated effluent. The treatment system reduces the pH and concentrations of arsenic in groundwater adjacent to the infiltration pond. In MW-6A adjacent to the infiltration pond, the groundwater pH decreased from 10.1 to 8.1 standard units between August 21, 2018 and November 6, 2018, and the corresponding concentrations of arsenic decreased from 53.6 micrograms per liter (µg/L) to 3.0 µg/L, which is below the 5 µg/L MTCA Method A groundwater cleanup level.

The treatment system encountered operational problems in the spring of 2019, resulting in system upgrades to improve its reliability. The treatment system resumed fulltime operation on May 29, 2019.

List of Attachments

1. Draft Agreed Order for Reserve Silica Site
2. Brathovde Public Comments on documents supporting Reserve Silica Agreed Order No. DE 16052 submitted on November 21, 2018
3. Brathovde Public Comments on DOE Agreed Order No. DE 16052 submitted on November 21, 2018
4. Reserve Silica Draft Remedial Investigation Reports Comments Submitted by Michael and Donna Brathovde to DOE January 9, 2018
5. Assessment of Reserve Silica's Proposed Mining Site Conversion Demonstration Project Prepared by Michael and Donna Brathovde for Friends of Rock Creek Valley, August 2016
6. Greater Maple Valley Unincorporated Area Council Memo dated December 7, 2018.
7. Comment from Hendrick Haynes dated December 7, 2018
8. Coal Reference Documents
9. Historical photographs and documentation provided by Michael Brathovde in emails on January 28 and 30, 2019

Attachment 1

Draft Agreed Order for Reserve Silica Site

Attachment 1

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

In the Matter of Remedial Action by:	AGREED ORDER
Reserve Silica Corporation	No. DE 16052
Holcim (US) Inc.	

TO: Marisa Floyd
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Albuquerque, NM 87102

Travis Bennett
Holcim (US) Inc.
14500 C.R. 1550
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TABLE OF CONTENTS

I. INTRODUCTION

The mutual objective of the State of Washington, Department of Ecology (Ecology), Reserve Silica Corporation (Reserve Silica), and Holcim (US) Inc. (Holcim) under this Agreed Order (Order) is to provide for remedial action at a facility where there has been a release or threatened release of hazardous substances. This Order requires Reserve Silica and Holcim to complete a Remedial Investigation (RI), Feasibility Study (FS), and prepare a preliminary Draft Cleanup Action Plan (DCAP) for the Site generally located on King County Tax Parcel Nos. 362206-9138, 012106-9011, and 352206-9046. Ecology believes the actions required by this Order are in the public interest.

In January 2016, Ecology completed a Site Hazard Assessment (SHA) of Facility Site ID No. 2041 located on land owned by Reserve Silica Corporation in Ravensdale, Washington. The SHA focused on two areas of interest that contain cement kiln dust (CKD):

- The lower disposal area (LDA), which is 7 acres, located in the western portion of what is now King County Tax Parcel No. 362206-9138.
- The Dale strip pit (DSP), which is 6 acres, located mostly in the eastern portion of what is now King County Tax Parcel No. 362206-9138.

The Site, defined as the area where hazardous substances have come to be located, will be delineated by the results of the RI conducted under this Order.

II. JURISDICTION

This Agreed Order is issued pursuant to the Model Toxics Control Act (MTCA), RCW 70.105D.050(1).

III. PARTIES BOUND

This Agreed Order shall apply to and be binding upon the Parties to this Order, their successors and assigns. The undersigned representative of each Party hereby certifies that he or she is fully authorized to enter into this Order and to execute and legally bind such Party to comply with this Order. Reserve Silica and Holcim, collectively referred to as the Potentially Liable Persons (PLPs), agree to undertake all actions required by the terms and conditions of this Order.

No change in ownership or corporate status shall alter the PLPs' responsibility under this Order. The PLPs shall provide a copy of this Order to all agents, contractors, and subcontractors retained to perform work required by this Order and shall ensure that all work undertaken by such agents, contractors, and subcontractors complies with this Order.

IV. DEFINITIONS

Unless otherwise specified herein, the definitions set forth in RCW 70.105D, WAC 173-204, and WAC 173-340 shall control the meanings of the terms in this Order.

A. Site: The Site constitutes a facility under RCW 70.105D.020(8). The Site is defined by where a hazardous substance, other than a consumer product in consumer use, has been deposited, stored, disposed of, or placed, or otherwise come to be located. Based upon factors currently known to Ecology, the Site is generally located at 26000 Black Diamond & Ravensdale Road, Ravensdale, Washington, as shown in the Preliminary Site Diagram (Exhibit A). Data collected prior to the implementation of this Order indicate the Site may be contained on Parcel No. 362206-9138, owned by Ravensdale 6 LLC, Parcel No. 012106-9011, owned by Reserve Silica Corporation, and Parcel No. 352206-9046, owned by Baja Properties L.L.C. The boundaries of the Site, however, will be delineated following the completion of a RI conducted under this Order and approved by Ecology. The Site does not include the area where coal and sand processing facilities were historically located on Parcel No. 352206-9018 ("plant site"). Hazardous substance releases at the plant site constitute a separate site, not addressed under this Order, because the sources and types of contamination at that location are distinct from, and do not overlap with, the CKD-related hazardous substance releases.

B. Parties: Refers to the Parties to this Agreed Order: the State of Washington, Department of Ecology, Reserve Silica Corporation, and Holcim (US) Inc. and any other PLP that subsequently executes this Order.

C. Potentially Liable Persons (PLPs): Refers to two of the three named PLPs: Reserve Silica Corporation and Holcim (US) Inc. Ecology also notified BNSF Railway of its status as a PLP at the Site, but BNSF Railway declined to participate in this Order.

D. Agreed Order or Order: Refers to this Order and each of the exhibits to this Order. All exhibits are integral and enforceable parts of this Order.

V. FINDINGS OF FACT

Ecology makes the following findings of fact, without any express or implied admissions of such facts by the PLPs:

A. The LDA and DSP are located on King County Tax Parcel No. 362206-9138, formerly owned by Reserve Silica Corporation, but now held by its subsidiary Ravensdale 6 LLC. Infiltration ponds that receive leachate from the LDA cross the property boundary onto King County Tax Parcel No. 352206-9046, owned by Baja Properties L.L.C.

B. The Reserve Silica property was used for coal and sand mining until 2007. Reserve Silica is currently filling the final surface mine area at the Lower Pit and Middle Pit under a grading permit issued by King County Department of Permitting and Environmental Review, an Inert Waste Landfill Permit issued by Public Health – Seattle & King County, and the Sand and Gravel General Permit issued by the Department of Ecology.

C. The LDA was an open pit sand mine that was reclaimed between 1979 and 1982 by placing approximately 175,000 tons of CKD and other material into the excavation. A coal seam below the DSP was mined via tunnels until 1946 when the DSP was constructed as an open pit coal mine. The DSP was reclaimed in the 1980s with approximately 250,000 cubic yards of material including CKD. Water in contact with CKD is known to result in high pH (basic) leachate, which may contain metals such as arsenic and other hazardous substances, and can cause metals in native soils to dissolve into surface or groundwater. Additional sand-mining pits, the North Pit, Tan Sand Pit, Upper Pit, Lower Pit, and Middle Pit located on other portions of the property, were filled with materials that are not suspected to be CKD. Reserve Silica continues to reclaim the Lower Pit and Middle Pit; the remaining sand pits have been reclaimed.

D. A Holcim predecessor company generated the CKD and arranged for its disposal at the Reserve Silica property in the 1970s and 1980s. The CKD disposal was conducted under a solid waste management permit issued by the King County Public Health Department. Since 2002,

under contractual and easement agreements with Reserve Silica, Holcim has conducted activities at the property with the intent of reducing and controlling leachate seeps. To support the environmental activities involving CKD, in 2011 Holcim acquired an "Easement Agreement Involving Site Environmental Activities" (Easement Agreement) from Reserve Silica (King County Recording No. 2011027000636). The Easement Agreement included the areas of the LDA and DSP, a Seep and Facilities area adjacent to the LDA, and roads for access to all areas and monitoring wells.

E. The LDA and DSP were filled and closed under solid waste permits issued by the King County Public Health Department, currently known as Public Health – Seattle & King County (Public Health). The LDA and DSP are currently maintained under a Post Closure Maintenance Permit issued by Public Health.

F. Seeps of leachate from the LDA were documented in Public Health inspection reports as early as 1986. Interceptor trenches were installed during that time frame to control the seeps but were not effective. Further attempts have been made to reduce the volume of leachate seepage, including:

- Beginning in 2002, development of a monitoring well system and quarterly reporting to Ecology and Public Health.
- Installation of bedrock monitoring wells in December 2006 followed by quarterly monitoring and reporting. The wells were installed in accordance with a work plan that included a sampling and analysis plan and quality assurance project plan. These plans were reviewed and approved by Ecology and Public Health.
- In 2007, Holcim upgraded the soil cover on the LDA to a minimum thickness of two feet to reduce infiltration, the cover was regraded to improve surface water runoff, and a surface water diversion ditch was constructed around the up-slope boundary of the cover.
- In 2008, Holcim constructed and monitored a seep collection test trench system to evaluate the feasibility of installing a full-scale trench system to collect high pH seepage from the LDA.

- In November 2010 to early 2011, the DSP cover was upgraded to ensure a minimum thickness of two feet of soil cover, positive drainage, and a vegetated cover surface.
- In February 2013, Holcim installed a surface water collection ditch and concrete catch basin to capture leachate seeps from the LDA and direct them from the catch basin via a 1,000-foot tightline pipe to the infiltration ponds.
- In September 2013, Holcim installed a gravel-filled groundwater interceptor trench upgradient of the LDA to capture and redirect groundwater before it flowed through the LDA.
- During 2013/2014, Holcim conducted LDA hydrological investigations and groundwater and surface water statistical evaluations.

These measures did not eliminate the leachate seeps.

G. Currently, leachate continues to be collected in a trench and ditch system on the west side of the LDA and directed from the catch basin by pipeline to infiltration ponds on the north side of the property.

H. Surface water and groundwater samples are routinely sampled, analyzed, and reported for dissolved metals, general chemistry and field parameters. Maximum concentrations of arsenic detected in surface water, shallow groundwater, and bedrock groundwater exceed the MTCA Method A cleanup level of 5 µg/L. The maximum concentration of lead detected in surface water exceeds the MTCA Method A cleanup level of 15 µg/L. The pH of surface water samples routinely exceeds 12 standard units for pH.

I. In February 2016, Ecology completed a Site Hazard Assessment of Facility Site ID No. 2041 owned by Reserve Silica. The overall rank was 1, indicating the highest priority. The ranking was based on sampling data exceedances of cleanup levels for arsenic and lead in surface water and shallow groundwater around the LDA and DSP.

J. In June 2016, Ecology's Water Quality Program issued a Notice of Violation (NOV) for the Reserve Silica property for causing high pH water to leach out of the mine area and into the infiltration ponds at pH levels in excess of limits set forth in the Sand and Gravel General

Permit. On April 27, 2016, Ecology measured pH as high as 12.75 in the infiltration ponds and 12.86 at the seep control ditch.

K. On July 29, 2016, Holcim filed a Technical Memorandum with Ecology as its required response to the NOV. Holcim also installed chain-link fences with locking gates around the infiltration pond, the seep collection area, and the South Pond.

L. In further response to the NOV, in 2017/2018 Holcim designed and installed a system to treat the CKD seepage before it enters the infiltration ponds. The treatment system includes a carbon dioxide treatment unit to lower the pH of the leachate and an iron filings adsorption unit to remove arsenic from the leachate. The work included extending the existing collection trench to the north to capture additional leachate. Ecology and Public Health reviewed and approved the system design before construction. The treatment system began treating leachate on September 28, 2018.

M. In December 2017 Holcim conducted a Lower Disposal Area Trench Borehole Investigation in accordance with a work plan approved by Ecology and Public Health. The purpose of the investigation was to evaluate the feasibility of extending the existing groundwater interception trench.

N. At the time of the Site Hazard Assessment, the Reserve Silica property consisted of three legal parcels: 012106-9002 (now Lot 3), 362206-9065 (now Lot 1), and 352206-9018 (plant site). In 2017, King County approved a further division of the property, creating four additional legal parcels: 012106-9010 (Lot 2), 012106-9011 (Lot 5), 012106-9012 (Lot 4), and 362206-9138 (Lot 6). The boundaries of King County Parcel No. 362206-9138 are coterminous with the easement area granted Holcim in 2011. On November 21, 2017, Reserve Silica granted Parcel No. 362206-9138 to Ravensdale 6 LLC, a wholly-owned subsidiary of Reserve Industries (King County Recording No. 20180105000921).

O. In 2017, Reserve Silica completed an independent (i.e., not under a MTCA order) Remedial Investigation of its property. The RI report was received by Ecology on November 21,

2017. The focus of the RI was on the Reserve Silica property (i.e., the plant site parcel) outside of the areas known or suspected to be affected by releases from the LDA and DSP.

P. After reviewing the independent RI report submitted by Reserve Silica, Ecology shared a list of preliminary data gaps with the PLPs on January 30, 2018.

Q. In September 2018, on behalf of Reserve Silica, Aspect Consulting submitted a memorandum regarding a technical justification for the definition of the Site at the Reserve Silica properties in Ravensdale.

R. The Site remediation process and a draft of this Agreed Order were discussed during a public meeting on November 16, 2018. Ecology received public comments from Michael and Donna Brathovde on November 21, 2018, from the Greater Maple Valley Unincorporated Area Council on December 7, 2018, and from Hendrick "Hank" Haynes on December 7, 2018. Michael and Donna Brathovde also reference and provided previously submitted comments to Ecology, including comments on the independent Reserve Silica RI report (November 21, 2017) and the Ecology preliminary data gaps memorandum (January 30, 2018), and an independent report entitled "Assessment of Reserve Silica's Proposed Mining Site Conversion Demonstration Project" prepared by Friends for Rock Creek Valley in August 2016. Michael Brathovde sent supplemental historical photographs and documents to Ecology by email on January 28 and 30, 2019. Ecology will respond to these public comments in a Responsiveness Summary letter.

S. On May 9, 2019, Aspect Consulting, on behalf of Reserve Silica, submitted a Summary of RI Data Gaps Investigation Results: Plant Site and Lower Haul Road, Reserve Silica, Ravensdale, Washington, dated May 8, 2019.

VI. ECOLOGY DETERMINATIONS

Ecology makes the following determinations, without any express or implied admissions of such determinations (and underlying facts) by the PLPs.

A. Reserve Silica is an "owner or operator" as defined in RCW 70.105D.020(22) of a "facility" as defined in RCW 70.105D.020(8).

B. A Holcim predecessor company arranged for disposal of hazardous substances under RCW 70.105D.040(1)(c) at the "facility" as defined in RCW 70.105D.020(8) in two areas known as the LDA and the DSP.

C. Based upon all factors known to Ecology, a "release" or "threatened release" of "hazardous substance(s)" as defined in RCW 70.105D.020(32) and (13), respectively, has occurred at the Site. Ecology expects to determine the boundaries of the Site, that is, the area where hazardous substances have come to be located, based on the findings of the Remedial Investigation conducted under VII of this Agreed Order.

D. Based upon credible evidence, Ecology issued PLP status letters to Reserve Silica and Holcim dated July 14, 2017, pursuant to RCW 70.105D.040, .020(26), and WAC 173-340-500. After providing for notice and opportunity for comment, reviewing any comments submitted, and concluding that credible evidence supported a finding of potential liability, Ecology issued a determination that Reserve Silica and Holcim are PLPs under RCW 70.105D.040 and notified Reserve Silica and Holcim of this determination by letters dated September 5, 2017.

E. Based upon credible evidence, Ecology issued a PLP status letter to BNSF Railway dated January 23, 2018, pursuant to RCW 70.105D.040, .020(26), and WAC 173-340-500. After providing for notice and opportunity for comment, reviewing any comments submitted, and concluding that credible evidence supported a finding of potential liability, Ecology issued a determination that BNSF Railway is a PLP under RCW 70.105D.040 and notified BNSW Railway of this determination by letter dated March 5, 2018,

F. Pursuant to RCW 70.105D.030(1) and .050(1), Ecology may require PLPs to investigate or conduct other remedial actions with respect to any release or threatened release of hazardous substances, whenever it believes such action to be in the public interest. Based on the foregoing facts, Ecology believes the remedial actions required by this Order are in the public interest.

G. Under WAC 173-340-430, an interim action is a remedial action that is technically necessary to reduce a threat to human health or the environment by eliminating or substantially

reducing one or more pathways for exposure to a hazardous substance, that corrects a problem that may become substantially worse or cost substantially more to address if the remedial action is delayed, or that is needed to provide for completion of a site hazard assessment, remedial investigation, feasibility study, or design of a cleanup action plan. Either party may propose an interim action under this Order. If the Parties are in agreement concerning the interim action, the Parties will follow the process in Section VII.D. If the Parties are not in agreement, Ecology reserves its authority to require interim action(s) under a separate order or other enforcement action under RCW 70.105D, or to undertake the interim action itself.

VII. WORK TO BE PERFORMED

Based on the Findings of Fact and Ecology Determinations, it is hereby ordered that the PLPs take the following additional remedial actions at the Site.

A. The PLPs will complete a Remedial Investigation and Feasibility Study and submit an Ecology Review preliminary draft Cleanup Action Plan for the Site in accordance with the schedule and terms of the Scope of Work and Schedule, Exhibit B, and all other requirements of this Order.

B. The PLPs shall submit to Ecology written quarterly Progress Reports that describe the actions taken during the previous quarter to implement the requirements of this Order. All Progress Reports shall be submitted by the tenth (10th) day of the month in which they are due after the effective date of this Order. Unless otherwise specified by Ecology, Progress Reports and any other documents submitted pursuant to this Order shall be sent by certified mail, return receipt requested, to Ecology's project coordinator. The Progress Reports shall include the following:

a. A list of on-site activities that have taken place during the quarter;
b. Detailed description of any deviations from required tasks not otherwise documented in project plans or amendment requests;
c. Description of all deviations from the Scope of Work and Schedule (Exhibit B) during the current quarter and any planned deviations in the upcoming quarter;

d. For any deviations in schedule, a plan for recovering lost time and maintaining compliance with the schedule;

e. All raw data (including laboratory analyses) received by the PLPs during the past quarter and an identification of the source of the sample; and

f. A list of deliverables for the upcoming quarter if different from the schedule.

C. All plans or other deliverables submitted by the PLPs for Ecology's review and approval under the Scope of Work and Schedule (Exhibit B) shall, upon Ecology's approval, become integral and enforceable parts of this Order.

D. If the Parties agree on an interim action under Section VI.E, the PLPs shall prepare and submit to Ecology an Interim Action Work Plan, including a scope of work and schedule, by the date determined by Ecology. Ecology will provide public notice and opportunity to comment on the Interim Action Work Plan in accordance with WAC 173-340-600(16). The PLPs shall not conduct the interim action until Ecology approves the Interim Action Work Plan. Upon approval by Ecology, the Interim Action Work Plan becomes an integral and enforceable part of this Order, and the PLPs are required to conduct the interim action in accordance with the approved Interim Action Work Plan.

E. If Ecology determines that the PLPs have failed to make sufficient progress or failed to implement the remedial action, in whole or in part, Ecology may, after notice to the PLPs, perform any or all portions of the remedial action or at Ecology's discretion allow the PLPs opportunity to correct. The PLPs shall reimburse Ecology for the costs of doing such work in accordance with Section VIII.A (Remedial Action Costs). Ecology reserves the right to enforce requirements of this Order under Section X (Enforcement).

F. Except where necessary to abate an emergency situation, the PLPs shall not perform any remedial actions at the Site outside those remedial actions required by this Order, unless Ecology concurs, in writing, with such additional remedial actions.

G. Reports shall be provided in an Americans with Disability Act (ADA) accessible format as identified by Ecology under developing guidance.

VIII. TERMS AND CONDITIONS

A. Payment of Remedial Action Costs

The PLPs shall pay to Ecology costs incurred by Ecology pursuant to this Order and consistent with WAC 173-340-550(2). These costs shall include work performed by Ecology or its contractors for, or on, the Site under Chapter 70.105D RCW, including remedial actions and Order preparation, negotiation, oversight, and administration. These costs shall include work performed both prior to and subsequent to the issuance of this Order. Ecology's costs shall include costs of direct activities and support costs of direct activities as defined in WAC 173-340-550(2). Ecology has accumulated $24,017.89 in remedial action costs related to this Site as of June 2018. For all Ecology costs incurred, the PLPs shall pay the required amount within 30 days of receiving from Ecology an itemized statement of costs that includes a summary of costs incurred, an identification of involved staff, and the amount of time spent by involved staff members on the project. A general statement of work performed will be provided upon request. Itemized statements shall be prepared quarterly. Pursuant to WAC 173-340-550(4), failure to pay Ecology's costs within 90 days of receipt of the itemized statement of costs will result in interest charges at the rate of 12 percent per annum, compounded monthly.

In addition to other available relief, pursuant to RCW 19.16.500, Ecology may utilize a collection agency and/or, pursuant to RCW 70.105D.055, file a lien against real property subject to the remedial actions to recover unreimbursed remedial action costs.

B. Designated Project Coordinators

The project coordinator for Ecology is:

Alan Noell
Department of Ecology, Northwest Regional Office
3190 160th Ave. SE
Bellevue, WA 98008
Office: 425-649-7015
Email: alan.noell@ecy.wa.gov

The project coordinator for Reserve Silica is:

Marisa Floyd
20 First Plaza Ctr NW
Suite 308
Albuquerque, NM 87102
Office: 505-247-2384
Cell: 505-453-6932
Email: mlfloyd@swcp.com

The project coordinator for Holcim is:

Travis Bennett
Holcim (US) Inc.
14500 C.R. 1550
Ada, OK 74820
Office: 580-421-8926
Cell: 580-421-2057
Email: travis.bennett@lafargeholcim.com

Each project coordinator shall be responsible for overseeing the implementation of this Order. Ecology's project coordinator will be Ecology's designated representative for the Site. To the maximum extent possible, communications between Ecology and the PLPs, and all documents, including reports, approvals, and other correspondence concerning the activities performed pursuant to the terms and conditions of this Order shall be directed through the project coordinators. The project coordinators may designate, in writing, working level staff contacts for all or portions of the implementation of the work to be performed required by this Order.

Any party may change its respective project coordinator. Written notification shall be given to the other party at least 10 calendar days prior to the change.

C. Performance

All geologic and hydrogeologic work performed pursuant to this Order shall be under the supervision and direction of a geologist or hydrogeologist licensed by the State of Washington or under the direct supervision of an engineer registered by the State of Washington, except as otherwise provided for by Chapter 18.43 and 18.220 RCW.

All engineering work performed pursuant to this Order shall be under the direct supervision of a professional engineer registered by the State of Washington, except as otherwise provided for by Chapter 18.43.130 RCW.

All construction work performed pursuant to this Order shall be under the direct supervision of a professional engineer or a qualified technician under the direct supervision of a professional engineer. The professional engineer must be registered by the State of Washington, except as otherwise provided for by RCW 18.43.130.

Any documents submitted containing geologic, hydrogeologic, or engineering work shall be under the seal of an appropriately licensed professional as required by RCW 18.43 and 18.220.

The PLPs shall notify Ecology in writing of the identity of any engineer(s) and geologist(s), contractor(s) and subcontractor(s), and others to be used in carrying out the terms of this Order, in advance of their involvement at the Site.

D. Access

Ecology or any Ecology authorized representative shall have access to enter and freely move about all property at the Site that the PLPs either own, control, or have access rights to at all reasonable times for the purposes of, *inter alia*: inspecting records, operation logs, and contracts related to the work being performed pursuant to this Order; reviewing the PLPs' progress in carrying out the terms of this Order; conducting such tests or collecting such samples as Ecology may deem necessary; using a camera, sound recording, or other documentary type equipment to record work done pursuant to this Order; and verifying the data submitted to Ecology by the PLPs. The PLPs shall make all reasonable efforts to secure access rights for those properties within the Site not owned or controlled by the PLPs where remedial activities or investigations will be performed pursuant to this Order. Ecology or any Ecology authorized representative shall give reasonable notice before entering any Site property owned or controlled by the PLPs unless an emergency prevents such notice. All persons who access the Site pursuant to this section shall comply with any applicable health and safety plan(s). Ecology employees and their representatives shall not be required to sign any liability release or waiver as a condition of Site property access.

E. Sampling, Data Submittal, and Availability

With respect to the implementation of this Order, the PLPs shall make the results of all sampling, laboratory reports, and/or test results generated by it or on its behalf available to Ecology. Pursuant to WAC 173-340-840(5), all sampling data shall be submitted to Ecology in both printed and electronic formats in accordance with Section VII (Work to be Performed), Ecology's Toxics Cleanup Program Policy 840 (Data Submittal Requirements), and/or any subsequent procedures specified by Ecology for data submittal.

If requested by Ecology, the PLPs shall allow Ecology and/or its authorized representative to take split or duplicate samples of any samples collected by the PLPs pursuant to implementation of this Order. The PLPs shall notify Ecology not less than 7 days in advance of any sample collection or work activity at the Site. Ecology shall, upon request, allow the PLPs and/or its authorized representative to take split or duplicate samples of any samples collected by Ecology pursuant to the implementation of this Order, provided that doing so does not interfere with Ecology's sampling. Without limitation on Ecology's rights under Section VIII.D (Access), Ecology shall notify the PLPs prior to any sample collection activity unless an emergency prevents such notice.

In accordance with WAC 173-340-830(2)(a), all hazardous substance analyses shall be conducted by a laboratory accredited under Chapter 173-50 WAC for the specific analyses to be conducted, unless otherwise approved by Ecology.

F. Public Participation

Ecology shall maintain the responsibility for public participation. However, the PLPs shall cooperate with Ecology, and shall:

1. If agreed to by Ecology, develop appropriate mailing lists and prepare drafts of public notices and fact sheets at important stages of the remedial action, such as the submission of work plans, remedial investigation reports, feasibility study reports, cleanup action plans, and engineering design reports. As appropriate, Ecology will edit, finalize,

and distribute such fact sheets and prepare and distribute public notices of Ecology's presentations and meetings.

2. Notify Ecology's project coordinator prior to the preparation of all press releases and fact sheets, and before meetings related to remedial action work to be performed at the Site with the interested public and/or local governments. Likewise, Ecology shall notify the PLPs prior to the issuance of all press releases and fact sheets related to the Site, and before meetings related to the Site with the interested public and local governments. For all press releases, fact sheets, meetings, and other outreach efforts by the PLPs that do not receive prior Ecology approval, the PLPs shall clearly indicate to its audience that the press release, fact sheet, meeting, or other outreach effort was not sponsored or endorsed by Ecology.

3. When requested by Ecology, participate in public presentations on the progress of the remedial action at the Site. Participation may be through attendance at public meetings to assist in answering questions or as a presenter.

4. When requested by Ecology, arrange and/or continue information repositories to be located at the following locations:

a. Maple Valley Public Library
21844 SE 248th Street
Maple Valley, WA 98038

b. Ecology's Northwest Regional Office
3190 160th Ave SE
Bellevue, WA 98008

At a minimum, copies of all public notices, fact sheets, and documents relating to public comment periods shall be promptly placed in these repositories. A copy of all documents related to this Site shall be maintained in the repository at Ecology's Northwest Regional Office in Bellevue, Washington.

G. Retention of Records

During the pendency of this Order, and for 10 years from the date of completion of work performed pursuant to this Order, the PLPs shall preserve all records, reports, documents, and underlying data in its possession relevant to the implementation of this Order and shall insert a similar record retention requirement into all contracts with project contractors and subcontractors. Upon request of Ecology, the PLPs shall make all records available to Ecology and allow access for review within a reasonable time.

Nothing in this Order is intended to waive any right the PLPs may have under applicable law to limit disclosure of documents protected by the attorney work-product privilege and/or the attorney-client privilege. If the PLPs withhold any requested records based on an assertion of privilege, the PLPs shall provide Ecology with a privilege log specifying the records withheld and the applicable privilege. No Site-related data collected pursuant to this Order shall be considered privileged.

H. Resolution of Disputes

1. In the event that the PLPs elect to invoke dispute resolution the PLPs must utilize the procedure set forth below.

    a. Upon the triggering event (receipt of Ecology's project coordinator's written decision or an itemized billing statement), the PLPs have 14 calendar days within which to notify Ecology's project coordinator in writing of its dispute (Informal Dispute Notice).

    b. The Parties' project coordinators shall then confer in an effort to resolve the dispute informally. The parties shall informally confer for up to 14 calendar days from receipt of the Informal Dispute Notice. If the project coordinators cannot resolve the dispute within those 14 calendar days, then within 7 calendar days Ecology's project coordinator shall issue a written decision (Informal Dispute Decision) stating: the nature of the dispute; the PLPs' position with regards to the dispute; Ecology's position with regards to the dispute; and the extent of resolution reached by informal discussion.

c. The PLPs may then request regional management review of the dispute. This request (Formal Dispute Notice) must be submitted in writing to the Northwest Region Solid Waste Management Section Manager within 7 calendar days of receipt of Ecology's Informal Dispute Decision. The Formal Dispute Notice shall include a written statement of dispute setting forth: the nature of the dispute; the disputing Party's position with respect to the dispute; and the information relied upon to support its position.

d. The Section Manager shall conduct a review of the dispute and shall issue a written decision regarding the dispute (Decision on Dispute) within 30 calendar days of receipt of the Formal Dispute Notice. The Decision on Dispute shall be Ecology's final decision on the disputed matter.

2. The Parties agree to only utilize the dispute resolution process in good faith and agree to expedite, to the extent possible, the dispute resolution process whenever it is used.

3. Implementation of these dispute resolution procedures shall not provide a basis for delay of any activities required in this Order, unless Ecology agrees in writing to a schedule extension.

4. In case of a dispute, failure to either proceed with the work required by this Order or timely invoke dispute resolution may result in Ecology's determination that insufficient progress is being made in preparation of a deliverable, and may result in Ecology undertaking the work under Section VII.E (Work to be Performed) or initiating enforcement under Section X (Enforcement).

I. Extension of Schedule

1. The PLPs' request for an extension of schedule shall be granted only when a request for an extension is submitted in a timely fashion, generally at least 30 days prior to expiration of the deadline for which the extension is requested, and good cause exists for granting the extension. All extensions shall be requested in writing. The request shall specify:

a. The deadline that is sought to be extended;

b. The length of the extension sought;

c. The reason(s) for the extension; and

d. Any related deadline or schedule that would be affected if the extension were granted.

2. The burden shall be on the PLPs to demonstrate to the satisfaction of Ecology that the request for such extension has been submitted in a timely fashion and that good cause exists for granting the extension. Good cause may include, but may not be limited to:

a. Circumstances beyond the reasonable control and despite the due diligence of the PLPs including delays caused by unrelated third parties or Ecology, such as (but not limited to) delays by Ecology in reviewing, approving, or modifying documents submitted by the PLPs;

b. Acts of God, including fire, flood, blizzard, extreme temperatures, storm, or other unavoidable casualty; or

c. Endangerment as described in Section VIII.K (Endangerment).

However, neither increased costs of performance of the terms of this Order nor changed economic circumstances shall be considered circumstances beyond the reasonable control of the PLPs.

3. Ecology shall act upon any PLPs' written request for extension in a timely fashion. Ecology shall give the PLPs written notification of any extensions granted pursuant to this Order. A requested extension shall not be effective until approved by Ecology. Unless the extension is a substantial change, it shall not be necessary to amend this Order pursuant to Section VIII.J (Amendment of Order) when a schedule extension is granted.

4. At the PLPs' request, an extension shall only be granted for such period of time as Ecology determines is reasonable under the circumstances. Ecology may grant schedule extensions exceeding 90 days only as a result of:

a. Delays in the issuance of a necessary permit which was applied for in a timely manner;

b. Other circumstances deemed exceptional or extraordinary by Ecology; or

c. Endangerment as described in Section VIII.K (Endangerment).

J. Amendment of Order

The project coordinators may verbally agree to minor changes to the work to be performed without formally amending this Order. Minor changes will be documented in writing by Ecology within 7 days of verbal agreement.

Except as provided in Section VIII.L (Reservation of Rights), substantial changes to the work to be performed shall require formal amendment of this Order. This Order may only be formally amended by the written consent of both Ecology and the PLPs. Ecology will provide its written consent to a formal amendment only after public notice and opportunity to comment on the formal amendment.

When requesting a change to the Order, the PLPs shall submit a written request to Ecology for approval. Ecology shall indicate its approval or disapproval in writing and in a timely manner after the written request is received. If Ecology determines that the change is substantial, then the Order must be formally amended. Reasons for the disapproval of a proposed change to this Order shall be stated in writing. If Ecology does not agree to a proposed change, the disagreement may be addressed through the dispute resolution procedures described in Section VIII.H (Resolution of Disputes).

K. Endangerment

In the event Ecology determines that any activity being performed at the Site under this Order is creating or has the potential to create a danger to human health or the environment on or surrounding the Site, Ecology may direct the PLPs to cease such activities for such period of time as it deems necessary to abate the danger. The PLPs shall immediately comply with such direction.

In the event the PLPs determine that any activity being performed at the Site under this Order is creating or has the potential to create a danger to human health or the environment, the PLPs may cease such activities. The PLPs shall notify Ecology's project coordinator as soon as possible, but no later than 24 hours after making such determination or ceasing such activities. Upon Ecology's direction, the PLPs shall provide Ecology with documentation of the basis for the

determination or cessation of such activities. If Ecology disagrees with the PLPs' cessation of activities, it may direct the PLPs to resume such activities.

If Ecology concurs with or orders a work stoppage pursuant to this section, the PLPs' obligations with respect to the ceased activities shall be suspended until Ecology determines the danger is abated, and the time for performance of such activities, as well as the time for any other work dependent upon such activities, shall be extended in accordance with Section VIII.I (Extension of Schedule) for such period of time as Ecology determines is reasonable under the circumstances.

Nothing in this Order shall limit the authority of Ecology, its employees, agents, or contractors to take or require appropriate action in the event of an emergency.

L. Reservation of Rights

This Order is not a settlement under Chapter 70.105D RCW. Ecology's signature on this Order in no way constitutes a covenant not to sue or a compromise of any of Ecology's rights or authority. Ecology will not, however, bring an action against the PLPs to recover remedial action costs paid to and received by Ecology under this Order. In addition, Ecology will not take additional enforcement actions against the PLPs regarding remedial actions required by this Order, provided the PLPs comply with this Order.

Ecology nevertheless reserves its rights under Chapter 70.105D RCW, including the right to require additional or different remedial actions at the Site should it deem such actions necessary to protect human health or the environment, and to issue orders requiring such remedial actions. Ecology also reserves all rights regarding the injury to, destruction of, or loss of natural resources resulting from the release or threatened release of hazardous substances at the Site.

By entering into this Order, the PLPs do not admit to any liability for the Site. Although the PLPs are committing to conducting the work required by this Order under the terms of this Order, the PLPs expressly reserve all rights available under law, including but not limited to the right to seek cost recovery or contribution against third parties, and the right to assert any defenses to liability in the event of enforcement.

M. Transfer of Interest in Property

No voluntary conveyance or relinquishment of title, easement, leasehold, or other interest in any portion of the Site shall be consummated by the PLPs without provision for continued implementation of all requirements of this Order and implementation of any remedial actions found to be necessary as a result of this Order.

Prior to the PLPs' transfer of any interest in all or any portion of the Site, and during the effective period of this Order, the PLPs shall provide a copy of this Order to any prospective purchaser, lessee, transferee, assignee, or other successor in said interest; and, at least 30 days prior to any transfer, the PLPs shall notify Ecology of said transfer. Upon transfer of any interest, the PLPs shall notify all transferees of the restrictions on the activities and uses of the property under this Order and incorporate any such use restrictions into the transfer documents.

N. Compliance with Applicable Laws

1. All actions carried out by the PLPs pursuant to this Order shall be done in accordance with all applicable federal, state, and local requirements, including requirements to obtain necessary permits or approvals, except as provided in RCW 70.105D.090. At this time, no federal, state, or local requirements have been identified as being applicable to the actions required by this Order. The PLPs have a continuing obligation to identify additional applicable federal, state, and local requirements which apply to actions carried out pursuant to this Order, and to comply with those requirements. As additional federal, state, and local requirements are identified by Ecology or the PLPs, Ecology will document in writing if they are applicable to actions carried out pursuant to this Order, and the PLP must implement those requirements.

2. All actions carried out by the PLPs pursuant to this Order shall be done in accordance with relevant and appropriate requirements identified by Ecology. At this time, no relevant and appropriate requirements have been identified as being applicable to the actions required by this Order. If additional relevant and appropriate requirements are identified by Ecology or the PLPs, Ecology will document in writing if they are applicable to actions carried out pursuant to this Order and the PLP must implement those requirements.

3. Pursuant to RCW 70.105D.090(1), the PLPs may be exempt from the procedural requirements of Chapters 70.94, 70.95, 70.105, 77.55, 90.48, and 90.58 RCW and of any laws requiring or authorizing local government permits or approvals. However, the PLPs shall comply with the substantive requirements of such permits or approvals. For permits and approvals covered under RCW 70.105D.090(1) that have been issued by local government, the Parties agree that Ecology has the non-exclusive ability under this Order to enforce those local government permits and/or approvals. At this time, no state or local permits or approvals have been identified as being applicable but procedurally exempt under this section.

4. The PLPs have a continuing obligation to determine whether additional permits or approvals addressed in RCW 70.105D.090(1) would otherwise be required for the remedial action under this Order. In the event either Ecology or the PLPs determine that additional permits or approvals addressed in RCW 70.105D.090(1) would otherwise be required for the remedial action under this Order, it shall promptly notify the other party of its determination. Ecology shall determine whether Ecology or the PLPs shall be responsible to contact the appropriate state and/or local agencies. If Ecology so requires, the PLPs shall promptly consult with the appropriate state and/or local agencies and provide Ecology with written documentation from those agencies of the substantive requirements those agencies believe are applicable to the remedial action. Ecology shall make the final determination on the additional substantive requirements that must be met by the PLPs and on how the PLPs must meet those requirements. Ecology shall inform the PLPs in writing of these requirements. Once established by Ecology, the additional requirements shall be enforceable requirements of this Order. The PLPs shall not begin or continue the remedial action potentially subject to the additional requirements until Ecology makes its final determination.

Pursuant to RCW 70.105D.090(2), in the event Ecology determines that the exemption from complying with the procedural requirements of the laws referenced in RCW 70.105D.090(1) would result in the loss of approval from a federal agency that is necessary for the state to administer any federal law, the exemption shall not apply and the PLPs shall comply with both the

procedural and substantive requirements of the laws referenced in RCW 70.105D.090(1), including any requirements to obtain permits or approvals.

O. Indemnification

The PLPs agree to indemnify and save and hold the State of Washington, its employees, and agents harmless from any and all claims or causes of action (1) for death or injuries to persons, or (2) for loss or damage to property, to the extent arising from or on account of acts or omissions of the PLPs, their officers, employees, agents, or contractors in entering into and implementing this Order. However, the PLPs shall not indemnify the State of Washington nor save nor hold its employees and agents harmless from any claims or causes of action to the extent arising out of the negligent acts or omissions of the State of Washington, or the employees or agents of the State, in entering into or implementing this Order.

IX. SATISFACTION OF ORDER

The provisions of this Order shall be deemed satisfied upon the PLPs' receipt of written notification from Ecology that the PLPs have completed the remedial activity required by this Order, as amended by any modifications, and that the PLPs have complied with all other provisions of this Agreed Order.

X. ENFORCEMENT

Pursuant to RCW 70.105D.050, this Order may be enforced as follows:

A. The Attorney General may bring an action to enforce this Order in a state or federal court.

B. The Attorney General may seek, by filing an action, if necessary, to recover amounts spent by Ecology for investigative and remedial actions and orders related to the Site.

C. A liable party who refuses, without sufficient cause, to comply with any term of this Order will be liable for:

1. Up to three times the amount of any costs incurred by the State of Washington as a result of its refusal to comply.

2. Civil penalties of up to $25,000 per day for each day it refuses to comply.

D. This Order is not appealable to the Washington Pollution Control Hearings Board. This Order may be reviewed only as provided under RCW 70.105D.060.

Effective date of this Order: 12/16/2019

RESERVE SILICA CORPORATION

Marisa Floyd
Vice President
Albuquerque, NM
505-453-6932

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

Peter Christiansen
Section Manager
Solid Waste Management Program
Northwest Regional Office
425-649-7076

HOLCIM (US) INC.

Jodie Earle
Director, Litigation and Asst. Corporate Secretary
Dundee, MI
734-529-4360

N

Ravensdale Lake

PLANT SITE

Infiltration Ponds

LOT 1
King County Tax Parcel 362206-9065

LOT 6
KING COUNTY TAX PARCEL 362206-9138

King County Tax Parcel 352206-9018

KING COUNTY TAX PARCEL 352206-9046

LOT 2
King County Tax Parcel 012106-9010

Lower Disposal Area

North Pit

Tan Sand Pit

Upper Pit

Dale Strip Pit

BPA TRANSMISSION LINE EASEMENT

Middle Pit

Lower Pit

BLACK DIAMOND-RAVENSDALE RD SE

LOT 4
King County Tax Parcel 012106-9012

LOT 5
INERT WASTE LANDFILL
KING COUNTY TAX PARCEL 012106-9011

LOT 3
King County Tax Parcel 012106-9002

0 250 500
Feet

Preliminary Site
Property Boundaries
Historical Coal and/or Sand Mine Pit Extent
BPA Transmission Line Easement

Preliminary Site Diagram

Reserve Silica
Ravensdale, Washington

Aspect Consulting	SEP-2018	BY: CEB / TDR	EXHIBIT NO. A
	PROJECT NO. 160315	REVISED BY: RAP	

Basemap Layer Credits || Pictometry, King County

EXHIBIT B – SCOPE OF WORK AND SCHEDULE

Agreed Order No. DE 16052

SCOPE OF WORK

PURPOSE

The work under this Agreed Order (AO) involves conducting a Remedial Investigation (RI) and Feasibility Study (FS), conducting interim actions if required or agreed to by Ecology, and preparing a preliminary Draft Cleanup Action Plan (DCAP) to select a cleanup alternative. The purpose of the RI, FS, and preliminary DCAP for the Site is to provide sufficient data, analysis, and evaluations to enable Ecology to select a cleanup alternative for the Site.

The Scope of Work is divided into seven major tasks as follows:

Task 1. RI Work Plan
Task 2. Remedial Investigation
Task 3. Interim Action(s) (if required)
Task 4. Feasibility Study
Task 5. State Environmental Policy Act (SEPA) Compliance
Task 6. Public Participation
Task 7. DCAP

To assist with preparation of these documents, Ecology's Toxics Cleanup Program (TCP) has developed checklists. The PLPs shall use the most current version of the following remedial action checklists (as modified by more specific requirements in this Scope of Work).

- Remedial Investigation Report Checklist
- Feasibility Study Report Checklist
- Cleanup Action Plan Checklist

The PLPs can download the checklists directly from the following website: http://www.ecy.wa.gov/programs/tcp/policies/checklists.html

Policy 840 Environmental Information Management System (EIM) (April 2016)

In April 2016, Ecology updated Policy 840 related to data submittal requirements for TCP sites. Policy 840 requires environmental monitoring data collected at TCP sites as part of site investigations and cleanups to be submitted into the EIM database at the time of submittal for Ecology review of any report containing this data.

The PLPs shall coordinate with Ecology throughout the development of the Interim Action (if deemed necessary), RI, FS, and preliminary DCAP and shall keep Ecology informed of changes to any Work Plan or other project plans, and of any issues or problems as they develop.

TASK 1. RI WORK PLAN

The PLPs shall prepare a Remedial Investigation Work Plan (Work Plan). The Work Plan shall include an overall description and schedule of all RI activities. The Work Plan shall clearly describe the project management strategy for implementing and reporting on RI activities. The responsibility and authority of all organizations and key personnel involved in conducting the RI will be outlined.

A RI planning and scoping meeting will be held prior to submittal of the RI Work Plan. The purpose of the RI Planning and Scoping Meeting is to review requirements for the Work Plan and plan Remedial Investigation field work, discuss the Conceptual Site Model, and identify project data needs and possible interim actions.

The Work Plan shall describe general facility information; site history and conditions, including a summary of previous operations and an evaluation of available evidence of activities of former owners or operators that may have resulted in the release of hazardous substances; past field investigations, including any data collection and analysis of soils, air, groundwater, surface water, and sediments; a Conceptual Site Model showing contaminants, migration pathways in all environmental media, potential receptors, and screening levels based on the Conceptual Site Model; geology and groundwater system characteristics; past, current, and future land use; identification of natural resources and ecological receptors; hazardous substances and their sources, etc., in compliance with WAC 173-340-350 and WAC 173-204-560.

As part of the project background, existing environmental data on site soil, groundwater, surface water, and sediments will be compiled and evaluated for data gaps. The data gaps will be used as the basis for conducting additional site investigations, if necessary. The Work Plan will also identify specific data collection procedures in a Sampling and Analysis Plan (SAP) and Quality Assurance Project Plan (QAPP) as part of the Work Plan in compliance with WAC 173-340-820 and WAC 173-204-600 for defining the nature and extent of contamination. The PLPs will also submit a copy of the Health and Safety Plan (HASP) for the project. Ecology anticipates that the PLPs' consultants may develop company-specific SAPs, QAPPs, and HASPs.

The SAP identifies the proposed number, location, and depth of all environmental samples and methods, including soil borings, groundwater monitoring wells, soil, groundwater, stormwater, seep, catch basin, and sediment samples. The SAP will describe the sampling objectives, the rationale for the sampling approach (based upon the identified data gaps), and plans for data use, and shall provide a detailed description of sampling tasks. The SAP shall describe specifications for sample identifiers; sampling equipment; the type, number,

and location of samples to be collected; the analyses to be performed; descriptions of sampling equipment and methods to be used; sample documentation; sample containers, collection and handling; data and records management; and schedule.

The Quality Assurance Project Plan (QAPP) will be prepared in accordance with the Guidance for Preparation of Quality Assurance Project Plans, EPA Region 10, Quality Data Management Program, QA/R-5 and requirements of the EPA Contract Laboratory Program. The QAPP will also follow Ecology's Guidelines for Preparing Quality Assurance Project Plans for Environmental Studies (July 2004)[1] and Sediment Sampling and Analysis Plan Appendix (February 2008).[2] Laboratories must meet the accreditation standards established in WAC 173-50. Data quality objectives will reflect the criteria or threshold values used for the source control evaluation.

The SAP, including the QAPP, will be submitted to Ecology for review and approval. As with all environmental work at the site, work may not begin without written approval from Ecology. The plan shall provide 7 days of notice to Ecology prior to beginning sampling. Ecology may obtain split samples.

The PLPs or their contractors shall submit all new sampling data generated under this SAP and any other recently collected data to Ecology for entry into the EIM database in accordance with WAC 173-340-840(5) and Ecology's Toxics Cleanup Program Policy 840: Data Submittal Requirements. Validated data will be entered into the EIM database within 30 days of submittal.

RI tasks and subtasks will include, but is not limited to soil, groundwater, seep, surface water, sediment, and catch basin sampling and analysis, as necessary to address data gaps identified in the Work Plan. In addition, the following must be included in the Work Plan:

- Develop a Conceptual Site Model for the Site including evaluation of all potential pathways and potential receptors that may exist for contaminants of concern at the Site.
- Define the nature and extent of contamination based on screening levels protective of all receptors at and downgradient of the Site.

The PLPs will provide Ecology with an Agency Review Draft RI Work Plan. Once Ecology reviews and approves the Work Plan, it will be considered the Final Work Plan. The Final Work Plan will be made available to the public prior to being implemented by the PLPs. While not a formal comment period, Ecology will consider comments received and may request a revision to the Final RI Work Plan before implementation. The Work Plan shall not be implemented until approved by Ecology. Once approved by Ecology, the PLPs will implement the Final Work Plan according to the schedule contained in this Exhibit.

[1] Found at http://www.ecy.wa.gov/biblio/0403030.html
[2] Found at http://www.ecy.wa.gov/biblio/qapp.html

The PLPs shall prepare two copies of the Agency Review Draft RI Work Plan and submit them, including one electronic copy each in Word (.doc) and Adobe (.pdf) formats, to Ecology for review and comment. After incorporating Ecology's comments on the Agency Review Draft RI Work Plan and after Ecology approval, the PLPs shall prepare three copies of the Final RI Work Plan and submit them, including one electronic copy each in Word (.doc) and Adobe (.pdf) formats, to Ecology.

TASK 2. REMEDIAL INVESTIGATION

The PLPs shall conduct an RI that meets the requirements of WAC 173-340-350(7) and WAC 173-204-560 according to the Work Plan as approved by Ecology. The RI will determine the nature and extent of contamination exceeding preliminary Model Toxics Control Act (MTCA) cleanup levels, preliminary Sediment Management Standards (SMS) cleanup standards, and other regulatory requirements. The RI must provide sufficient data and information to define the nature and extent of contamination and to develop and evaluate cleanup action alternatives.

Field sampling and analysis will be completed in general accordance with the SAP and QAPP. Deviation(s) from the approved SAP and QAPP must be communicated to Ecology immediately and documented as required by Ecology.

The PLPs shall provide interim data reports and updates to Ecology as new site data and information become available. Laboratory analysis data shall also be provided in electronic format when it has been validated. Raw laboratory data will be provided to Ecology upon request.

Prior to submittal of the Agency Review Draft RI Report, a RI pre-report meeting will be held. During the Remedial Investigation Pre-Report Check-In, Ecology and the PLPs will review available data and an updated Conceptual Site Model and discuss the content and organization of the Draft RI Report.

The PLPs shall compile the results of the Site investigation into an Agency Review Draft RI Report. The PLPs shall prepare two copies of the Agency Review Draft RI Report and submit them, including one electronic copy each in Word (.doc) and Adobe (.pdf) formats, to Ecology for review and comment.

After incorporating Ecology's comments on the Agency Review Draft RI Report, the PLPs shall prepare three copies of a Public Review Draft RI Report and submit them, including one electronic copy each in Word (.doc) and Adobe (.pdf) formats, to Ecology for distribution and public comment. Electronic survey data for monitoring locations, electronic lab data, and GIS maps of contaminant distribution shall also be provided for both the Agency Review Draft RI Report and Public Review Draft RI Reports either in the report or as attachments. The RI Report will not be considered Final until after a public review and comment period.

If the data collected during this investigation is insufficient to define the nature and extent of contamination, and/or to select a cleanup action plan an additional phase of investigation shall be conducted.

TASK 3. INTERIM ACTIONS (if required)

Remedial actions implemented prior to completion of the RI and FS will be considered interim actions. Interim actions are performed to:

- Reduce a threat to human health or the environment by eliminating or substantially reducing one or more pathways for exposure to a hazardous substance;
- Correct a problem that may become substantially worse or cost substantially more to address if the remedial action is delayed; or
- Provide for completion of the remedial investigation, feasibility study, or design of the cleanup action.

Interim actions will be implemented in accordance with WAC 173-340-430 and the AO, and will be designed in a manner that will not foreclose reasonable alternatives for any final cleanup action that may be required. Remedial actions for contaminated sediments will be designated partial cleanup actions and will be implemented pursuant to WAC 173-204-550(3)(d).

As detailed in the AO, if required by Ecology, or if proposed by the PLPs and approved by Ecology, **t**he PLPs will implement an interim action. Based upon information in the Agency Review Draft RI Report, interim action(s) may be needed to expedite control of releases to sediments or other environmental media pursuant to WAC 173-340-430.

The scope of the interim actions may include, but not be limited to, typical source control or containment elements such as:

- Soil or sediment removal.
- Groundwater remediation.
- Repair, slip lining, replacement, or closure of stormwater conveyances or other structures such as conduit, vaults, catch basins, etc.
- Removal of underground storage tanks and pipes.
- Removal of old drain fields or former surface impoundments.
- Proper abandonment of old wells.
- Removal of contaminated building or other structural material.
- Construction of a treatment facility.
- Shoreline stabilization such as bulkhead repair, erosion or seepage control, and grading or clearing.

If an interim action is to be performed, the PLPs will prepare and submit for Ecology approval an Agency Review Draft Interim Action Work Plan (IAWP) with detail

commensurate with the work to be performed. The Agency Review Draft IAWP shall include, as appropriate:

- Description of the interim action including its purpose, general requirements, and relationship to the (final) cleanup action (to the extent known);
- Summary of relevant RI and FS information, including at a minimum existing site conditions and alternative interim actions considered;
- Information regarding design and construction requirements, including a proposed schedule and personnel roles and responsibilities;
- Compliance Monitoring Plan;
- SAP/QAPP; and
- Permits required.

The PLPs will also submit a copy of the HASP for the project. The PLPs will be responsible for complying with the SEPA Rules including preparing and submitting an environmental checklist for the interim action, and will assist Ecology with presentations at any additional meetings that might be necessary for SEPA compliance or as part of the Public Participation Plan.

The PLPs shall prepare two copies of the Agency Review Draft Interim Action Work Plan and submit them, including one electronic copy each in Word (.doc) and Adobe (.pdf) formats, to Ecology for review. The PLPs shall incorporate Ecology's comments and then prepare two copies of the Public Review Draft Interim Action Work Plan and submit them, including one electronic copy each in Word (.doc) and Adobe (.pdf) formats, to Ecology. After a public notice and comment period for the Public Review Draft IAWP (and SEPA determination), Ecology will approve the IAWP (if appropriate) and the document will be considered Final. The PLPs shall prepare three copies of the Final Interim Action Work Plan submit them, including one electronic copy each in Word (.doc) and Adobe (.pdf) formats. Once approved by Ecology, the PLPs will implement the interim action according with the approved schedule.

Upon successful completion of the work, an Agency Review Draft Interim Action Report will be prepared as a separate deliverable. The PLPs shall prepare two copies of the Agency Review Draft Interim Action Report and submit them, including one electronic copy each in Word (.doc) and Adobe (.pdf) formats, to Ecology for review and approval. After incorporating Ecology's comments on the Agency Review Draft Interim Action Report and after Ecology approval, the PLPs shall prepare three copies of the Final Interim Action Report and submit them, including one electronic copy each in Word (.doc) and Adobe (.pdf) formats, to Ecology.

TASK 4. FEASIBILITY STUDY

The PLPs shall use the information obtained in the RI to prepare an Agency Review Draft Feasibility Study (FS) that meets the applicable requirements of WAC 173-340-350(8) according to the Schedule in this exhibit. The Agency Review Draft FS will evaluate remedial alternatives for site cleanup, consistent with MTCA and SMS requirements to

ensure protection of human health and the environment by eliminating, reducing, or otherwise controlling risk posed through each exposure pathway and migration route.

Prior to beginning the FS, a FS planning meeting will be held to review applicable or relevant and appropriate requirements (ARARs), potential remedial alternatives and establish points of compliance.

The Agency Review Draft FS will provide a detailed analysis of each remedial alternative according to the applicable requirements of WAC 173-340-350, MTCA Remedial Investigation and Feasibility Study, and WAC 173-204-560, SMS Cleanup Study. The remedial alternatives will be evaluated for compliance with the applicable requirements of WAC 173-340-360, Selection of Cleanup Actions, and WAC 173-204-560(4), including a detailed evaluation of remedial alternatives relative to the following criteria:

- Compliance with cleanup standards and applicable laws.
- Protection of human health.
- Protection of the environment.
- Provision for a reasonable restoration time frame.
- Use of permanent solutions to the maximum extent practicable.
- Degree to which recycling, reuse, and waste minimization are employed.
- Short-term effectiveness.
- Long-term effectiveness.
- Net environmental benefit.
- Implementability.
- Provision for compliance monitoring.
- Cost-effectiveness.
- Prospective community acceptance.

The remedial alternative that is judged to best satisfy the evaluation criteria will be identified. Justification for the selection will be provided, and the recommended remedial alternative further developed, in the FS Report.

The PLPs shall prepare two copies of the Agency Review Draft FS and submit them, including one electronic copy in Word (.doc) and Adobe (.pdf) formats, to Ecology for review. After addressing Ecology's comments on the Agency Review Draft FS, the PLPs shall prepare three copies of the Public Review Draft FS and submit them, including one electronic copy each in Word (.doc) and Adobe (.pdf) formats, to Ecology for distribution and public comment. The FS will not be considered Final until after a public review and comment period.

TASK 5. SEPA COMPLIANCE

The PLPs shall be responsible for complying with the SEPA Rules including preparing and submitting an environmental checklist. If the result of the threshold determination is a determination of significance (DS), the PLPs shall be responsible for the preparation of

draft and final environmental impact statements. The PLPs shall assist Ecology with coordinating SEPA public involvement requirements with MTCA public involvement requirements whenever possible, such that public comment periods and meetings can be held concurrently.

TASK 6. PUBLIC PARTICIPATION

The PLPs shall support Ecology in presenting the Public Review Draft RI Report, and the Public Review Draft FS Reports and SEPA evaluations, at two public meetings. The PLPs will assist Ecology with presentations at any additional meetings that might be necessary for SEPA compliance or as part of the Public Participation Plan.

After the public comment periods are completed, the PLPs shall prepare an Agency Review Draft Responsiveness Summary that addresses public comments. The PLPs shall prepare two copies of the Agency Review Draft Responsiveness Summary and submit them to Ecology for review and approval, including one electronic copy each in Word (.doc) and Adobe (.pdf) formats, to Ecology for distribution and public comment.

After addressing Ecology's comments and after Ecology approval, the PLPs shall prepare five copies of the Final Responsiveness Summary and submit them to Ecology for distribution, including one electronic copy each in Word (.doc) and Adobe (.pdf) formats.

TASK 7. PRELIMINARY DRAFT CLEANUP ACTION PLAN

Upon Ecology approval of the Public Review Draft Remedial Investigation Report and Public Review Draft Feasibility Study, a Cleanup Action Plan meeting will be held. The Cleanup Action Plan meeting will be used to review plans for developing the Agency Review preliminary Draft Cleanup Action Plan (DCAP).

The PLPs shall prepare an Agency Review preliminary DCAP in accordance with WAC 173-340-380 that provides a proposed remedial action to address the contamination present on the Site. Where contaminated sediments are included in the remedial action, the cleanup plan will comply with WAC 173-204-580, in addition to the MTCA requirements cited above. The preliminary DCAP shall include a general description of the proposed remedial actions, cleanup standards developed from the RI and FS and rationale regarding their selection, a schedule for implementation, description of any institutional controls proposed, and a summary of applicable local, state, and federal laws pertinent to the proposed cleanup actions.

The PLPs will submit an Agency Review preliminary DCAP for Ecology's review and approval. The Agency Review preliminary DCAP will include, but not be limited to, the information listed under WAC 173-340-380. The PLPs shall prepare two copies of the Agency Review preliminary DCAP and submit them, including one electronic copy each in Word (.doc) and Adobe (.pdf) formats, to Ecology for review and approval.

After receiving Ecology's comments on the Agency Review preliminary DCAP, if any, the PLPs shall revise the preliminary DCAP to address Ecology's comments and submit five copies of the Public Review DCAP including one electronic copy each in Word (.doc) and Adobe (.pdf) formats.

SCHEDULE OF DELIVERABLES

The schedule for deliverables described in the Agreed Order and the Scope of Work is presented below. If the date for submission of any item or notification required by this Schedule of Deliverables occurs on a weekend, state or federal holiday, the date for submission of that item or notification is extended to the next business day following the weekend or holiday. Where a deliverable due date is triggered by Ecology notification, comments or approval, the starting date for the period shown is the date the PLPs received such notification, comments or approval by certified mail, return receipt requested, unless otherwise noted below. Where triggered by Ecology receipt of a deliverable, the starting date for the period shown is the date Ecology receives the deliverable by certified mail, return receipt requested, or the date of Ecology signature on a hand-delivery form.

Deliverables	**Due Dates** [a]
Agency Review Draft RI Work Plan	90 calendar days following effective date of the Agreed Order[b]
Final RI Work Plan	30 calendar days following receipt of Ecology comments
Commencement of RI Field Work	60 calendar days following Ecology approval of the Final RI Work Plan.
Agency Review Draft RI Report	90 calendar days following receipt of validated data
Public Review Draft RI Report	45 calendar days following receipt of Ecology comments on Agency Review Draft RI Report
Final RI Report	30 calendar days following receipt of Ecology comments, subsequent to public comment
Agency Review Draft FS Report	90 calendar days following Ecology approval of Public Review Draft RI Report
Public Review Draft FS Report	45 calendar days following receipt of Ecology's comments on the Agency Review draft FS Report
Final FS Report	30 calendar days following receipt of Ecology comments, subsequent to public comment
Agency Review preliminary Draft Cleanup Action Plan (DCAP)	90 calendar days following approval of Final FS Report

[a] *Due dates shown are for initial draft and final deliverables. This schedule assumes only a single revised document will be submitted following receipt of comments from Ecology. Documents become final only upon approval by Ecology.*
[b] *Agreed Order is effective upon signature by both Ecology and PLPs.*

Attachment 2

Brathovde Public Comments on documents supporting Reserve Silica Agreed Order No. DE 16052 submitted on November 21, 2018

Attachment 2

Brathovde Public Comments on DOE Agreed Order # DE 16052 for Reserve Silica Property

Comments submitted November 21, 2018 by Michael and Donna Brathovde

We wish to thank DOE for the opportunity to submit public comments on the draft Agreed Order for this important Remedial Action, and for your careful and thoughtful consideration of this input in your deliberations. Note that we are also submitting comments on DOE's Preliminary Data Gaps document dated January 30, 2018; and on Aspect Consulting's technical memorandum on "Site" definition, dated September 4, 2018; as well as a couple of other related documents that provide additional background on this property that may prove useful in this MTCA cleanup process.

C1 We have two overriding concerns regarding the draft Agreed Order (AO). First, the AO (as well as the Public Participation Plan) focuses almost wholly on pH, arsenic and lead associated with the CKD and CKD leachate. While we agree this is the major concern, we strongly believe that historic uses of this property imply a high potential for other Contaminants of Concern (COC) to have been "*deposited, stored, disposed of, or placed, or otherwise come to be located*" on this property. We believe the AO should explicitly note the need to test for these other likely COC's.

C2 Our second, related overriding concern is that the AO suggests that the "Preliminary Site" for investigation is limited to Lot 6 (CKD Landfill), Lot 5 (Inert Waste Landfill), the Plant Site lot, and the Baja-owned parcel. This definition appears to have been taken directly from the technical memorandum submitted by Aspect Consulting, dated Sept 4, 2018; and is primarily driven by the CKD and CKD-leachate issue. We believe that for purposes of the Remedial Investigation (RI), the MTCA "Site" should remain the entire property. At minimum, the "Preliminary Site" should include the four parcels proposed by Aspect (Lots 5, 6, Plant Site and Baja parcels), as well as the north part of Lot 1, the east parts of Lots 3 and 4, and the northernmost thin strip of Lot 4. Please refer to our public comments on Aspect's technical memorandum on Site definition (separate submittal) for our rationale for proposing this broader definition of the "Preliminary Site" for the RI.

Other subordinate concerns and questions relating to the AO include:

C3 Sec IV, #C (PLP's); pg 5 - Given that BNSF Railway was identified as a Potentially Liable Party (PLP) in this case, and yet has declined to participate in this Agreed Order, are they still considered a PLP? And would they still be held liable to assist with any agreed Cleanup Action Plan?

C4 Sec V (Findings of Fact), #A; pg 5 – Historical documents show that extensive coal processing also occurred on parcels -9138 (Lot 6), -9065 (Lot 1), and -9046 (Baja).

C5 Sec V (Findings of Fact), #C; pg 5 – Besides pH, arsenic and lead, the US EPA's analysis of CKD dust solids and leachate chemistry also identified CKD as potentially contributing concentrations of thallium, antimony, chromium, total-2,3,7,8-substituted dioxins, and total hexachlorodibenzodioxin (GeoEngineers, *Preliminary Environmental Conditions Letter Report* to Reserve Silica, Jun 22, 2015). Other studies have shown that when materials such as tires and medical wastes were used as a supplemental fuel source in the cement kilns generating the CKD, as we know occurred at times at the Ideal/Holnam plant that generated the CKD deposited at Ravensdale, extremely carcinogenic dioxins and furans can also be present in the CKD. Given the extremely high toxicity of some of these contaminants, and the high chance that some of these may well be associated with the CKD dumped at Ravensdale, the RI should explicitly test for these contaminants. This is particularly a risk should Reserve succeed in their long standing efforts to convince the County to upzone portions of this property to allow them to construct a housing development on these lands.

C6 Sec V (Findings of Fact), #L; pg 8 – Implementation of this treatment system is very encouraging. Have the testing results indicated success at controlling pH and arsenic? Is the system also expected to control lead or any other COC's known to be associated with CKD? Are monitoring wells MW-5A and MW-6A now indicating no contamination exceeding MTCA standards?

C7 Sec V (Findings of Fact), #O; pg 9 – While Reserve's independent RI assessed some of the property outside of the "*areas known or suspected to be affected by releases from the LDA and DSP*", this testing was extremely limited, and did NOT include many areas suspected of containing COC's (e.g., north part of Lot 1; east parts of Lots 3 & 4; majority of lower haul road or any of the other property roads; west portion of Plant Site). These should all be tested as part of the RI.

C8 Sec VI (Ecology Determinations), #C; pg 9 – We agree the "Site" should be defined based on findings from the RI under this AO (not the independent RI commissioned by Reserve). But we again emphasize that this RI should address other likely COC's (besides CKD-related pH, arsenic and lead), and should cover testing of the property beyond what the draft AO identifies as the "Preliminary Site". This testing should be clearly defined in the RI Workplan.

C9 Sec VII (Work To Be Performed), Intro, pg 10 & #A pg 11– Note that the "Site" has not yet been identified. But Exhibit A, "Preliminary Site Diagram" tends to imply that the RI, FS and DCAP will be limited to Lots 5, 6, Plant Site, and Baja parcels. We suggest that this section of the AO re-emphasize that the "Site" will be determined based on the RI, and that Exhibit A be revised to indicate the entire property, including the Baja parcel, be included in the "Preliminary Site" for RI study.

C10 Sec VII (Work To Be Performed), #B; pg 11 – Will quarterly reports and associated AO submittals (including RI Workplan) be entered on the Environmental Information Management System (EIM), and available for public monitoring?

C11 Exhibit A (Preliminary Site Diagram) – As indicated above, this definition of "Preliminary Site", proposed by Reserve/Aspect, tends to imply that the RI, FS and DCAP associated with this AO will be limited to the areas outlined in red. Such a limitation could preclude or diminish the importance of RI testing of other portions of this property where there is a high probability that toxic contaminants have been "*deposited, stored, disposed of, or placed, or otherwise come to be located.*" We recommend that the entire property, including the Baja parcel, be included within the "Preliminary Site" definition for this AO. See our public comments on Aspect's technical memorandum on Site definition (separate submittal) for our rationale for proposing this broader definition of the "Preliminary Site". Ultimately, the "Site" for FS and DCAP purposes will then be established based on the results and conclusions from the RI study.

C12 Exhibit B; (Task 1, RI Work Plan) – It appears the RI Workplan is where many of the issues/questions mentioned above will be addressed. And this Work Plan will dictate the scope and content of the RI and the Feasibility Study (FS). This Workplan also addresses many of the underpinnings of this issue (site history; past investigations; conceptual site model; geology and groundwater characteristics; past, current and future land use; nature and extent of contamination; ecological receptors; etc). Many of these topics have been seriously misrepresented in past communications from Reserve. As such, this Workplan is crucial to the success of this Remedial Action and this AO. As such, it is very important that the public be provided an opportunity to comment on the RI Workplan - before it is finalized.

C13 Exhibit B; (Task 2, RI); para 1 – "*The RI must provide sufficient data and information to define the nature and extent of contamination.*" We fully agree – and note that this must include likely contaminants besides those already being tested for in CKD leachate, and areas outside the "Preliminary Site" boundaries currently specified in this draft AO.

C14 Exhibit B; (Task 2, RI); para 6 – It is stated, *"The RI Report will not be considered Final until after a public review and comment period.*" But the Schedule of Deliverables in Exhibit B (page 9/9) indicates "*Public comment periods for the Draft RI and Draft FS Reports can be combined.*" However, DOE has indicated that this schedule implies the Draft FS Report is not expected until early 2021 – more than two years into the project! If public input is truly going to be considered in this process, it is important that the public have an opportunity to: (a) comment on the RI Workplan – before the RI Field Work has progressed substantially; (b) comment on the RI – before the Agency Review Draft FS is submitted; and (c) comment on the Public Review Draft FS Report – before the Agency Review Draft Cleanup Action Plan is submitted. Waiting for two years to solicit additional public review and comment does not "*promote meaningful community involvement,*", nor "*encourage the public to learn about and get involved in decision-making opportunities*" in this effort – key goals of the Public Participation Plan.

C15 Exhibit B; (Task 6, Public Participation); para 1 – "*The PLP's shall support Ecology in presenting the Public Review Draft RI Report and the Public Review Draft FS Reports and SEPA evaluations* ***at one public meeting*** *or hearing.*" [bold emphasis added]. As mentioned above, waiting to solicit public comment until the Public Review Draft FS Report is finalized – two years into the project, fails to meet DOE goals for Public Participation in this effort; and risks either (a) wasting a lot of effort that has to be re-done once public input deemed to be material to this issue has been received; or (b) ignoring public input because too much time and effort has already been expended in conflict with public input of a material nature. The public should be provided a review/comment opportunity at each stage in the process - as soon as DOE input has been incorporated into: (1) the draft RI Workplan; (2) the draft RI; (3) the draft FS; (4) any SEPA checklist or environmental impact statement; (5) any substantive Interim Action Plans; and (6) the Responsiveness Summary report. Note that formal public meetings are not likely necessary at each stage, but a notification and a formal public comment period should be provided.

C16 Exhibit B; (Task 7, Preliminary Draft Cleanup Action Plan); last para – AO calls for a Public Review DCAP, but Schedule of Deliverables does not show a public review/comment period for DCAP. Final adoption of the CAP should reflect public review/comment.

[*Note: in addition to the above comments on the draft Agreed Order, we are also submitting comments on DOE's Preliminary Data Gaps document dated Jan 30, 2018, and on Aspect Consulting's memorandum relating to Site definition, dated Sep 4, 2018.]*

Attachment 3

Brathovde Public Comments on DOE Agreed Order No. DE 16052
Submitted on November 21, 2018

Attachment 3

Brathovde Public Comments on documents supporting Reserve Silica Agreed Order # DE 16052
including:
DOE Preliminary Data Gaps document dated January 30, 2018
and
Aspect Consulting Site Definition memorandum dated September 4, 2018

Comments submitted November 21, 2018 by Michael and Donna Brathovde

In addition to our formal public comments on the Reserve Silica draft Agreed Order (AO) and Public Participation Plan, we would like to submit the following comments on DOE's Preliminary Data Gaps document dated January 30, 2018; and on Aspect Consulting's technical memorandum on "Site" definition, dated September 4, 2018. These two documents are foundational to the draft Agreed Order # DE 16052.

DOE "Preliminary Data Gaps" document, dated January 30, 2018

We compliment DOE on compiling this preliminary list of Data Gaps. However, we do have some additional Data Gaps we would suggest should also be evaluated in the RI. They include:

C1 Site-Wide Gap #3 – The Covington Well Field is also in close proximity to Kent Springs, and downgradient for groundwater flow below the contaminated infiltration ponds. Covington Well Field and Kent Springs are major sources of municipal water for these two cities. City of Kent has been actively involved in the Reserve Silica issues, but we do not know if Covington Water District has any awareness of these issues, or of any potential risk to their water supply from contaminates on Reserve's property. If they are not involved, Covington Water District should be contacted to provide input on this project.

C2 Plant Site Data Gap 3 – Note, there was a major transformer installation located approximately where the wheel wash is now located in the Dale Coal Company days (1926-1955). We have a map and photo of this installation, if that would be of help to DOE.

C3 Plant Site/Former Settling Ponds Gap #10 – We believe there is a real need for more test wells (besides AMW-1) in the SW end of this area to better understand the extent of contaminated groundwater flow beyond the infiltration ponds and wells MW-5A and MW-6A. This area would appear to be the most likely pathway for potential contamination of Ravensdale Creek and the downgradient Kent Springs and Covington Well Field municipal water supplies. We feel the MTCA RI process should also test for ASARCO roadbed slag-contamination from years of pumping the wastewater from the truck wheel wash to this settling pond area.

C4 Lot 3 Data Gap – As described in our January 9, 2018 comments on Reserve's independent RI, we feel the eastern portion of this lot should be tested for hazardous substances associated with industrial waste "fertilizers" (e.g., Cal-Mag, Ag Mag and Al Mag) and CKD-based liming agents. Use of these hazardous waste "products" were being aggressively promoted by Reserve Industries (L-Bar Products), their predecessor (Industrial Mineral Products – IMP), and by Holnam (predecessor of Holcim; and generator of the CKD dumped at Ravensdale) in the early sand-mining days of this property; and could explain the unusual state of the current forest growing on this lot. Any contamination on this Lot also has the potential to impact the adjacent Lake Sonia wetland complex, and Lot 4.

C5 Lot 4 Data Gap #2 – Past studies have documented contaminated surface water flows west of the South Pond and LDA leachate collection/interception structures. It would seem the Powell property (adjacent to Lot 4 and south of the Baja lot) should also be tested for CKD-related contaminants.

C6 Lot 6 & Lot 1 (& Baja parcel) Data Gap – The northern portions of these three lots along the Ravensdale-Black Diamond Road accommodated an extensive industrial coal processing complex from 1926 until demolished in 1955. Besides the usual coal washing, sorting and storage facilities, this complex also included multiple rail spurs, a forge, machine shops,

C6 blacksmith shops, oil house, powder house, sulfur storage building, generator house, boilers and a briquetting plant - among other facilities. We have a map showing the location of these facilities we would be happy to provide DOE. It would seem, given practices common in the 1920's – 1950's, there is a very high likelihood hazardous wastes were "*deposited, stored, disposed of, or placed, or otherwise come to be located*" on the industrial processing portions of these lots. It would seem these areas should be tested for hazardous wastes commonly associated with these kinds of operations during this time period.

Aspect Consulting's technical memorandum re: "Site" Definition, dated September 4, 2018

We STRONGLY disagree with this technical memorandum and the resulting proposal that the MTCA cleanup "Site" be limited to Lots 5 and 6 (and possibly the Plant Site). Aspect's characterization of Lots 1 – 4 being "*undisturbed, native, vegetated/forested properties*" is grossly misleading. And their statement that the reason DOE included these lots within the preliminary MTCA "Site" was "*simply because they were, at the time of the 2016 Site Hazard Assessment, within the boundaries of a larger lot, now defined by Lot 5 and 6, where hazardous substances are suspected or confirmed to be present*" is irrelevant. There are very compelling reasons for including portions of these four lots within the preliminary MTCA "Site" for purposes of the Remedial Investigation (RI). The independent RI executed by Aspect and submitted to DOE in November 2017, did not address <u>any</u> of these four lots – and thus provides no basis for eliminating these lots from the "Site". We would like to further comment on Aspect's "Rationale" for eliminating these lots as stated in this Sep 4, 2018 memorandum.

Lot 1 – Aspect indicates that "*except for the presence of a graded access road* [Lot 1 is] *undisturbed forest land. No historical activities occurred on these parcels; however, portions of* [this lot] *may have been harvested for timber in the early – to mid-1900's.*" The reality is that the NW portion of this lot accommodated many of the Dale Coal Company coal processing facilities, including three railroad spurs, from 1926 until their demolition in 1955. The NE portion of this lot is a huge coal tailings pile, which a prior Reserve environmental consultant, GeoEngineers (July 22, 2015), characterized as "*These tailings may result in contamination by heavy metals, carcinogenic polycyclic aromatic hydrocarbons (cPAHs), and other associated contaminants depending on the makeup of the tailings material.*" Note that portions of this tailings pile burned for multiple years during the Dale Coal Co. tenure. The northern portion of this lot is also underlain with mine tunnels, gangways and workings from the 1903 – 1915 time period; while the southeastern portion of the lot is underlain by some relatively shallow ("water level") mine workings from the 1899-1903 period. This SE portion of this lot also contains the upper reaches of two major strip mines, that were mined in the late 1940's – early 1950's. The lower reaches of these two mine "trenches" are currently being filled with imported fill material up to the property boundary by the neighboring landowner. The lot also contains ~ 3500' of roads, with strong evidence that ASARCO slag may have been utilized in the bedding and surfacing of these roads. As for harvest history, there is some evidence that this area was first logged in the late 1800's; and was logged again in the 1930's, and a third time in the 1970's, followed by replanting as part of the Northern Pacific/Burlington Northern/Plum Creek Black Diamond commercial forestry operating block. Given this history, Aspect's classification of this lot as being "*undisturbed forest land*" is grossly misleading; and their rationale for excluding this lot from the MTCA "Site" – "*There are no documented or suspected historical activities … that suggest a potential source of hazardous substances or represent a potential risk to human health or the environment*" must be rejected as patently false. At minimum, the northern half of this lot, and the roads, should remain within the MTCA "Site" pending further evaluation in the Remedial Investigation.

Lot 2 – As with Lot 1, Aspect classifies this as "*undisturbed forest land*". While this is somewhat closer to the truth than Lot 1, this lot does share the same harvest history as Lot 1; and also contains ~3900' of roads that may well contain ASARCO slag. The southernmost portion of this lot is also within the BPA powerline right-of-way, and is thus not forestland at all. And the southern half of this lot is underlain by the Dale No. 7 mine works. There have been some reports of past dumping into the adits (airshafts, borings, supply access shafts, etc.) of the Dale No. 4 and Dale No. 7 mines. Given this history, we recommend that Lot 2 remain within the "Preliminary Site" pending further RI investigation. At minimum, the roads on this Lot must remain in the "Preliminary Site".

Lot 3 – The western half of Lot 3 is a large wetland, feeding Lake Sonia, Ginder Lake, Rock Creek, Lake Sawyer and ultimately the Green River. The eastern portion of this lot shared the same harvest history as Lots 1 and 2 (as well as neighboring lands) – all part of the NP/BN/Plum Creek Black Diamond commercial forest operating block.

Aspect claims "*There are no documented or suspected historical activities on Lot 3 that suggest a potential source of hazardous substances or represent a potential risk to human health or the environment.*" They further indicate that this assertion is "*confirmed by the undisturbed vegetation on that lot.*" But as described in our January 9, 2018 comments on the independent RI; and as noted by former forestry consultants hired by Reserve (International Forestry Consultants [Feb 2012] and American Forest Management [May 2016]), for some unexplained reason, the forest conditions on this lot are dramatically different from the conditions on adjacent lots with the same soil and topographic conditions, and managed under the same forest management regimen. A possible explanation for this dramatic difference could be that the forest on this lot may have been treated with an industrial waste "fertilizer", or with a CKD-based liming agent, that were aggressively being promoted by Reserve Industries (L-Bar Products), and by Reserve's predecessor on this site, Industrial Mineral Products (IMP), and by Holnam (predecessor to Holcim, and generator of the CKD deposited on this site) during the 1980's. Both these "products" were later determined to contain hazardous wastes that, under some conditions, could have a lethal impact on certain plants. Given the unexplained cause of the dramatic difference in forest conditions on this lot compared to similar adjacent forests, and the aggressive promotion of these industrial waste "products" by Reserve Industries and their predecessors in years past, the RI should test the eastern portion of this lot for COC's known to be associated with Cal Mag, Ag Mag, Al Mag-type products, and with CKD-based liming agents.

Aspect also claims that "*as long as the DSP remains capped the possibility of contaminated surface water flowing from this source to Lot 3* [and the Lake Sonia wetland network] *is nil.*" That assertion may be hard to justify given the ongoing failures we've seen with attempts to control run-off from the capped LDA. But if the eastern portions of Lot 3 <u>were</u> found to contain hazardous wastes from past fertilizer or liming treatment (or other sources), this could represent a significant contamination risk to public waters of the Green River WRIA, separate from the risk posed from the infiltration ponds. As such, Lot 3 should NOT be eliminated from the MTCA "Site" pending additional testing in the RI.

Lot 4 – Aspect concedes that "*the thin strip of land that extends parallel to the west boundary of the Subject Property*" "r*equires additional monitoring as part of the Remedial Investigation work that remains related to the CKD-filled LDA.*" We wholeheartedly agree with this, as past studies have indicated contaminated leachate flowing on to this area. As such, this portion of Lot 4 should definitely remain within the MTCA "Site", pending additional study. Given this history, we also strongly suggest that the adjacent Powell property also be tested for CKD-related COC's as part of the RI.

Aspect dismisses the risk of contamination to Lot 4 from bedrock groundwater movement from the LDA, the DSP and from the Inert Waste Landfill (Lot 5) because "*bedrock groundwater flow direction is towards the north along north-northwest bedrock bedding plane fractures*". However, <u>if</u> soil contamination from hazardous waste "fertilizers" or CKD-based liming agents, or any other source, were to be confirmed on Lot 3 (see above), groundwater flows could directly transfer COC's to Lot 4 as well.

Aspect also dismisses the risk of contamination of Lot 4 from surface water flows from the upgradient DSP and the Inert Waste Landfill (Lot 5) because, upon closure of the Inert Waste Landfill, both these sources will be capped, and hence "*there will be no source of surface water runoff that could cascade onto Lot 4.*" Again, based on experience with the LDA, this may be an overly optimistic assumption.

Lot 4 south of the BPA easement also contains ~1000' of the Lower Haul Road. Limited testing performed under the independent RI confirmed the presence of ASARCO slag in the road bed (up to 6' deep) and road surface. CKD was also noted in samples adjacent to this road (up to 11' deep). And while the independent RI did not test the portion of the road running through Lot 4, the two closest samples tested just north of this Lot, showed the highest concentrations of COC's of all the road tests. Slag was also noted to be mixed with "*abundant organics*" and "*abundant woody debris*".

Prior testing of ASARCO slag by US EPA concluded that when slag is in proximity to organic wastes "*the decomposition of the wood releases organic acids which cause the metals bound to the slag to be released into the groundwater.*" (US EPA, 1994). As such, there certainly appears to be a risk that Lot 4 south of the BPA easement may well contain COC's associated with ASARCO slag, and with CKD, that should be tested for as part of the RI. Pending results of these tests, Lot 4 south of the BPA easement should not be excluded from the MTCA "Site".

Lot 5 (Inert Waste Landfill) – We concur with Aspect's recommendation that this Lot remain within the MTCA "Site".

Lot 6 (CKD Landfills) – We concur with Aspect's recommendation that this Lot remain within the MTCA "Site". RI testing of this site should also test for COC's associated with ASARCO slag, and COC's likely to be associated with the extensive coal processing facilities on the north end of this site from 1926 – 1955 (see comments on DOE Preliminary Data Gaps).

Another concern we have relates to the future potential risk of bedrock groundwater contamination from CKD within the capped DSP. The unlined DSP in which CKD was deposited, lies directly above the underground Dale No. 4 mine workings from 1926 through 1946. The Dale No. 4 and the Dale No. 7 mines were "water level" mines that shared a common mine portal and access tunnel. As a "water level" mine, the underground tunnels and workings were constructed in such a manner as to allow groundwater within the mine to flow naturally through the mine and mine tunnel, and exit to the surface at the mine portal (located on the north end of Lot 6). This design avoided the necessity of 24/7 operation of huge pumps to deal with extensive groundwater within the mine, which was a major on-going issue with the Ravensdale mines. Water flow through the Dale No. 4 and Dale No. 7 mine works, exiting at the Dale Portal, continues to this day. The Dale Portal is ~800' distant, and upgradient from Ravensdale Lake and Ravensdale Creek.

Past geologic and hydrogeologic studies by consultants for the PLP's have concluded that the bedrock fault lying just north of the DSP would serve as an effective barrier to the northward flow of any CKD-contaminated bedrock groundwater – thus protecting Ravensdale Lake and Creek should groundwater come into contact with CKD in the DSP at some point in the future. However, if groundwater should eventually find its way from the DSP into the underlying Dale No. 4 mineworks, the Dale tunnel would provide a direct path for this contaminated groundwater to breach the protective bedrock fault – spilling CKD-contaminated water directly to the surface, immediately above Ravensdale Lake. We are unsure of the vertical separation between the bottom of the CKD-filled DSP pit, and the top of the underlying Dale No. 4 mine workings. But it seems highly plausible that eventually groundwater will make its way from the pit to the underlying tunnels. Should this occur, this would represent a major CKD-contamination risk to Ravensdale Lake, Ravensdale Creek, and downstream municipal water sources.

Recent testing of the surface flow at the Portal has shown no indications of contamination by the CKD in the capped DSP. This is highly encouraging. Nonetheless, we feel it is imperative that the outflow of the Dale Mine portal continue to be monitored on a regular, on-going basis; and a plan, which could be quickly implemented to address this potential contamination source, should be developed as part of the cleanup process.

Plant Site – We concur with Aspect's recommendation that this Lot remain within the MTCA "Site", pending additional study. We do have concerns regarding Aspect's suggestion that any contamination found on the Plant Site "*will be handled separately than the remainder of the Subject Property where historic mining and landfilling activities occurred.*" While many of the expected COC's on the Plant Site are unique from COC's expected in the mining and landfilling portions of this site, they are likely not materially different from the expected COC's from the coal processing areas of Lots 1, 6 and Baja from the Dale Coal Co. days. And the Plant Site is downgradient from known and prospective sources of CKD-, ASARCO slag- and other industrial waste-contaminated ground and surface water sources south of the Ravensdale-Black Diamond Rd. Some of these contaminants have already migrated off-site (e.g., Baja property), and the exact extent of migration is unknown. The Plant Site represents the last geography between the areas known to be contaminated by CKD, and the extremely porous, high hydrologic-conductivity, Recessional Outwash till that underlies the surface and sub-surface flows leading to Kent Springs and Covington Well Field sources of municipal water. As such,

the Plant Site is a critical parcel for monitoring the spread of known contaminants; and prospectively, for mounting a last defense to contain this spread. As such, we strongly advise against splitting off the Plant Site from the MTCA cleanup of the remainder of this property.

Summary – We strongly disagree with Aspect's assessment and resulting recommendation that the MTCA "Site" be limited to Lot 6 (CKD Landfill), Lot 5 (Inert Waste Landfill), and possibly the Plant Site. Their stated rationale for eliminating Lots 1 – 4 from the "Site" is erroneous and misleading. While there are portions of each of these four lots that are unlikely to require cleanup under MTCA rules, we highly recommend retaining the entire property, including the Baja-owned parcel, as part of the MTCA "Site" pending further study as part of the Remedial Investigation under this Agreed Order.

[*Note: in addition to the above comments on DOE's Preliminary Data Gaps document, and Aspect Consulting's Sep 4, 2018 memorandum on Site definition, we are also submitting comments on the draft Agreed Order DE 16052.]*

Attachment 4

Reserve Silica Draft Remedial Investigation Reports Comments
Submitted by Michael and Donna Brathovde to DOE January 9, 2018

Attachment 4

Comment 1 Pg. 10

RESERVE SILICA DRAFT REMEDIAL INVESTIGATION REPORT COMMENTS

Submitted by Michael & Donna Brathovde, to DOE January 09, 2018

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RESERVE SILICA DRAFT REMEDIAL INVESTIGATION REPORT COMMENTS

Submitted by Michael & Donna Brathovde, to DOE January 09, 2018

EXECUTIVE SUMMARY

The draft Remedial Investigation Report, Reserve Silica Ravensdale Site document (RI), dated November 2017, was prepared by Aspect Consulting, LLC to characterize "the nature and extent of contamination at the Reserve Silica Ravensdale Property." Based on our review of this RI, we strongly disagree with Aspect's key conclusions, assertions and recommendations. We believe the current draft RI does an inadequate job of both identifying Contaminants of Concern (COCs) which might reasonably be expected on the Property, and in assessing the extent of possible contamination – i.e., defining the MTCA cleanup "Site".

Aspect identified three potential sources of contaminants on the Property which they felt could pose a risk to human health and the environment: (1) Leachate containing high pH and arsenic discharging from the Lower Disposal Area (LDA); (2) Arsenic and lead in road base and fill soil along the Lower Haul Road; and (3) Storage and use of petroleum products on the Plant Site. The LDA Leachate source is currently being addressed by Holcim and DOE separate from this RI, and thus the material presented in the RI represents findings from that ongoing investigation, and no additional analyses are offered by Aspect. Aspect's assessment of the Lower Haul Road did find slag present on, in and under the roadway; but they concluded the arsenic and lead associated with the slag did not appear to be leachable. As such, Aspect concluded that this potential contamination source did not pose a risk to health or the environment, beyond that already being addressed in the LDA Leachate effort. Aspect's assessment of the Plant Site did find localized cases of shallow soil contamination by petroleum-based products and arsenic. But test results indicated no contamination of lower soil strata or groundwater. This finding led to the suggestion "there is not a complete pathway for leaching from soil to groundwater", leading Aspect to conclude that this Plant Site source did not pose a risk to human health or the environment. Besides these two analyses (Lower Haul Road and Plant Site), and the ongoing Holcim/DOE assessment of the known LDA Leachate source, Aspect asserts that "No other investigation was warranted at this Property". Based on these findings, Aspect recommends that the MTCA 'Site' "… should be reduced from the full Property to Lot 6 or the portion containing the LDA and the area in which the leachate is discharging"; and "the focus of continued remedial action be on the LDA, leachate from the LDA, and migration of high pH and arsenic-contaminated groundwater and surface water" arising from the LDA. And Aspect states that this remaining remedial action is the responsibility of Holcim (US) Inc. as part of the Post-Closure Permit for the LDA.

We believe ongoing efforts to assess the full nature and extent of the contamination attributable to CKD in the LDA must be completed before a final determination of the MTCA "Site" can be made. We also believe there are several other areas of the Property, besides Lot 6, the Plant Site, and the Lower Haul Road, on which COCs are reasonable to suspect, but for which no testing has apparently been conducted. In addition, we believe that there are other COCs, beyond those reported in this draft RI, that may well be expected on this site, but for which no testing has apparently been done.

These perceived shortcomings in the draft RI are elaborated below. We feel these issues should be addressed as part of the RI, before the MTCA "Site" can be defined. And, as a Potentially Liable Party, we believe Reserve Silica, and their parent company, Reserve Industries, should not be released from liability or responsibility before a thorough Remedial Investigation, Feasibility Study, and Cleanup Action Plan are finalized for this Property.

RESERVE SILICA DRAFT REMEDIAL INVESTIGATION REPORT COMMENTS

Submitted by Michael & Donna Brathovde, to DOE January 09, 2018

1.0 INTRODUCTION

The following reflects our comments/concerns regarding the draft *Remedial Investigation Report, Reserve Silica Ravensdale Site* document, dated November 2017, as prepared and submitted to DOE by Aspect Consulting, LLC. These comments are respectfully submitted to DOE by Michael & Donna Brathovde; January 09, 2018.

We commend Reserve Silica, and Aspect Consulting, for performing this analysis, and assembling this draft Remedial Investigation (RI) report. The information contained in this draft report certainly advances our collective understanding of the environmental and human health risks posed by this Property. And we thank DOE for allowing us the opportunity to submit comments on this draft for DOE consideration as they evaluate this RI.

1.1 Objective of RI Study

The reported objective for the draft RI is "*to fully characterize the nature and extent of contamination at the Reserve Silica Ravensdale Property."* [1] While we admit to being novices regarding evaluation of hazardous waste contamination, our understanding is that characterizing the "nature" of the contamination involves identifying the Contaminants of Concern (COCs) which might reasonably be expected to occur on the Property, as well as the media known or suspected to be impacted; while characterizing the "extent" of contamination involves testing for *"any area where a hazardous substance has been deposited, stored, disposed of, or placed, or otherwise come to be located."*[2] This area is then defined as the MTCA "Site".

1.2 Our Overall Assessment of Draft RI

Based on this understanding, we believe the current draft RI does an inadequate job of both identifying COC's which might reasonably be expected on the Property, and in assessing the extent of possible contamination – i.e., defining the "Site".

1.3 Overview of Aspect's Draft RI Study & Conclusions

Aspect claims to have assessed "*the nature and extent of contamination at the Reserve Silica Ravensdale Property"*[3] (i.e., the full 377 acres [4]), and further states that "*This RI Report addresses the entire Property*".[5] Based on their assessment, they identified three potential sources of contaminants on the Property "*where the documented or potential presence of COCs may pose a risk to human health and the environment*": (1) "*Leachate containing high pH and arsenic discharging from the LDA;"* (2) *"Arsenic and lead in road base and shallow subsurface fill soil …. along the Lower Haul Road;"* and (3)*"Storage and use of petroleum products on the Plant Site."* [6]

With regards to source #1 (leachate from the LDA), Aspect states that because "*The nature and extent of elevated pH and dissolved arsenic and lead in surface and groundwater attributed to discharge from the LDA …. is being managed and overseen by the responsible party Holcim (US) Inc., their consultants, and Ecology ….. this data gap is part of the Closed Landfill OU#1 and not part of this RI."* [7] Furthermore, besides assessing the other two potential sources of contamination (Plant Site and Lower Haul Road), Aspect asserts that "*no*

hazardous conditions have been identified anywhere else on the Property" [8] and that "*No other investigation was warranted at this Property …*"[9] Based on the analyses presented in this draft RI, Aspect concludes that the Plant Site "*does not pose a risk to human health or the environment*" [10]; and the slag, arsenic and lead present in the surface and shallow subsurface fill along the Lower Haul Road "*do not appear to be leachable."* [11] As such, Aspect's overall recommendation is that *"…the Site should be reduced from the full Property to Lot 6 or the portion containing the LDA and the area in which the leachate is discharging*"[12] and "*the focus of continued remedial action be on the LDA, leachate from the LDA, and migration of high pH and arsenic-contaminated groundwater and surface water that either is piped to the Infiltration Ponds, flows overland into the South Pond, or migrates to groundwater in the shallow aquifer."* [13] And Aspect states that this remaining remedial action is the responsibility of Holcim (US) Inc. as part of the Post-Closure Permit for the LDA.[14] As such, Aspect's recommendation under this draft RI would imply that the MTCA "Site" would be limited to Lot 6 (or a portion thereof), and Reserve Silica would have no further responsibility in the cleanup effort as all remaining areas of concern are under the responsibility of Holcim (US) Inc.

1.4 Our Reaction to Aspect's Draft RI Conclusions and Recommendations

We strongly disagree with Aspect's key conclusions, assertions and recommendations.

(1) We find that there seems to be no evidence-based rationale for Aspect's assertion that *"…the Site should be reduced from the full Property to Lot 6 or the portion containing the LDA and the area in which the leachate is discharging."*[15]

(2) We believe ongoing efforts to assess the nature and extent of the contamination attributable to CKD in the LDA must be completed before a final determination of the MTCA cleanup "Site" can be made.

(3) We believe there are several other areas of the Property, besides Lot 6, the Plant Site, and the Lower Haul Road, on which Contaminants of Concern (COCs) are reasonable to suspect, but for which no testing has apparently been conducted.

(4) We believe that there are other COCs, beyond those reported in this draft RI, that may well be expected on this site, but for which no testing has apparently been done.

(5) We also have concerns regarding the adequacy of Aspect's evaluation of the Plant Site and the Lower Haul Road in this draft RI.

We feel these issues should be addressed as part of the RI before the MTCA "Site" can be defined. And, as a Potentially Liable Party, we believe Reserve Silica, and their parent company, Reserve Industries, should not be released from liability or responsibility before a thorough Remedial Investigation, Feasibility Study, and Cleanup Action Plan are finalized. These perceived shortcomings in the draft RI are elaborated below.

2.0 COMMENTS ON ASPECT'S RI ANALYSES, CONCLUSIONS AND RECOMMENDATIONS

2.1 Comments on Aspect's Evaluation of the Plant Site Contamination Risk

From our novice perspective, it appears that Aspect's evaluation of the Plant Site is quite comprehensive; though we question their rationale for excluding this area from the "Site". The test results do show localized soil contamination above MTCA Method A cleanup levels by Diesel Range Organics, Heavy Oil-Range Organics, Total Naphthalene and Total cPAH TEQ near the site of the Diesel Underground Storage Tank (AB-2 soil boring), and by arsenic in the equipment storage and maintenance area (AMW-5). Reported test results indicate that this contamination appears to be confined to the upper soil layers, and the test results would further indicate it has not penetrated to deeper (7.5 foot) levels, nor contaminated underlying groundwater. Based on these results, Aspect concludes "*there is not a complete pathway for leaching from soil to groundwater*"[16]. While the lab results would tend to infer this, there is nothing in the well logs for these test holes that would appear to indicate an actual barrier to deeper penetration of the contamination; unless it could be that the 3 ½ - 5' thick stratum of coal tailings lying from 2 ½' and 8' below the surface is filtering/immobilizing these contaminants from further penetration. However, no soil test samples were submitted from the coal tailings stratum from any of the test holes to indicate if contaminates are present within this stratum. Based on their 'incomplete leaching pathway' conclusion, Aspect concludes that these identified contamination cases are "*limited in extent and not impacting groundwater and therefore, does not pose a risk to human health or the environment.*"[17] Based on this conclusion, Aspect recommends excluding the ~9 acre Plant Site from the MTCA "Site".

However, these test samples do show shallow soil contamination above MTCA cleanup levels. As such, these localized areas of the Plant Site do satisfy the MTCA "Site" definition (*"any area where a hazardous substance has been deposited, stored, …."*). And given the extremely close proximity to groundwater-fed Ravensdale Lake (~60' distant, with surface level just ~6' below the Plant Site ground level), it seems we should be particularly careful with known sources of contamination like those identified in the RI study. And given that Reserve has not committed to any particular future use of this site (and has suggested a public "open space" use), it would seem that this shallow, contaminated soil could reasonably be expected to pose a future risk to human health as well. As such, it would seem these localized areas of the Plant Site should be included in the MTCA "Site"; and cleanup of this documented shallow soil contamination should be addressed.

As novices, another question regarding the Plant Site RI testing would be the apparently high levels of dissolved metals (calcium, magnesium, potassium and sodium) in the groundwater samples from all five wells (AMW-1 through AMW-5) on this parcel.[18] While there appear to be no MTCA Method A cleanup levels set for these dissolved metals, the observed concentrations exceed PQL in all cases.[19] Is this an issue of concern? And could the high levels of calcium and sodium (and magnesium?) in Ravensdale Lake[20] be associated with operations on either the plant site or the mining/dumping portions of the site? Also, the DOE SHA indicates past testing for manganese, but we see no testing for manganese in any of these RI lab samples. Is this something that should be tested for in the RI?

2.2 Comments on Aspect's Evaluation of Slag and the Lower Haul Road Contamination Risk

Aspect did eight test borings in the Lower Haul Road adjacent to the LDA, explicitly checking for the presence of ASARCO slag, which was reportedly used in the road beds and surfacing of roads on the Property. These borings confirmed the presence of slag "*in surface and shallow subsurface fill"* [up to a

depth of 6' below ground level]. [21] Testing of select soil samples from these borings for arsenic and lead [22] showed the presence of arsenic above MTCA Method A Cleanup Levels, and one instance where lead exceeded MTCA levels. Aspect reported that Leachability tests on these samples indicated "*arsenic and lead in soils are not leachable and, therefore not mobile*".[23] As such, Aspect dismisses the presence of ASARCO slag, and its associated arsenic and lead contamination registering above MTCA cleanup levels, from further consideration in the RI.

Without further investigation, we strongly disagree with dismissing slag and its resulting contamination from the RI. We have several issues with Aspect's RI analysis in this regard.

First, Aspect's recommendation to dismiss the impact of slag in this RI is totally dependent on the 'non-leachable' test conclusion. This conclusion appears to us to be contrary to EPA's assessment of ASARCO slag. EPA indicated that groundwater under the ASARCO smelter site had been contaminated with arsenic, copper, zinc and other metals. They also found leaching to groundwater from slag in the presence of saltwater. And when slag is in proximity to organic wastes, e.g., wood debris, "*the decomposition of the wood releases organic acids which cause the metals bound to the slag to be released into the groundwater.*"[24] The well logs for some of Aspect's Lower Haul Road borings indicate the presence of "abundant organics", "abundant woody debris", etc. So it would appear, based on our novice understanding, that Aspect's 'non-leachable slag' conclusion may be inconsistent with EPA's assessment, particularly in the presence of the documented organic materials. It would seem this apparent inconsistency should be explicitly addressed prior to dismissing the impact of ASARCO slag from the RI.

Second, the leachability test performed by Aspect was designed "*to evaluate material sitting in place that is exposed to rainfall to simulate the leaching potential of a contaminant and assess chemical mobility in the environment.*"[25] But we question whether this test adequately evaluates the leachability of these metals under onsite conditions. Specifically, it would appear that this test simulates leachability in the presence of rainwater – which is typically slightly acidic. We know on this site, surface and groundwater pH's can be extremely alkaline due to the CKD leachate (pH to 13 and above). So the big question is whether the slag on, in and below the Lower Haul Road, and the arsenic and lead associated with it, is stable in the presence of this extremely alkaline surface/groundwater, or whether it may be leachable under these unusual conditions. It does not appear that any test of slag-contaminant leachability in the presence of highly-alkaline surface/ground water was performed. Given the unique conditions of this location, it would seem such testing should be a part of the RI.

Third, Aspect's testing of the Lower Haul Road was limited to a short (~850') stretch of the road adjacent to the north end of the LDA. This road actually follows the LDA for another ~1,000' further south. But for some unspecified reason, this southern segment was not tested in the draft RI. This is especially of concern given that the southernmost two tests Aspect did do, showed the deepest concentrations of slag, high arsenic levels, and the highest pH of all the 'groundwater grab samples' tested. Furthermore, there would seem to be no basis whatsoever to limit the testing for ASARCO slag material to just the portion of the Lower Haul Road along the LDA. The likely source of the slag on the Property roads was Reserve's predecessor, Industrial Mineral Products (IMP), which mined the Property for silica sand from 1972 until 1986. During this time period, IMP also had the exclusive contract to purchase copper slag from the ASARCO smelter in Tacoma. From about 1973 to 1985, IMP was aggressively selling this slag material as road ballast, fill material, driveway gravel, and for numerous other purposes. Obviously, IMP also used this

slag on the Property's roads. And we know of no reason to suspect that they limited the use of slag to the Lower Haul Road along the LDA. There is another ~2,600 feet of the Lower Haul Road beyond the LDA, plus ~5,000 feet of Upper Haul Road, plus another 1,500+ feet of other roads on the Property. Apparently none of these have been tested for slag either. And these roads impact Lots 3, 4 and 5 to the south of the RI Lower Haul Road testing area, as well as Lots 1 and 2 in the northeast. It would certainly seem that additional borings on the roads in other portions of the Property should be conducted as part of the RI – particularly if it is determined that contaminants known to be associated with ASARCO slag are leachable under onsite conditions of very high pH ground and surface water, or when in contact with organic debris.

Fourth, while we could find no detailed Laboratory test results in the RI for the Lower Haul Road borings, it would appear that the RI testing checked only for arsenic and lead.[26] ASARCO slag is known to be very high in arsenic.[27] However, slag from the ASARCO smelter in Tacoma was also laden with other toxic metals including lead and copper (as well as cadmium, antimony, chromium, nickel and zinc; and organic compounds such as dimethylaniline?).[28] [29] [30] In addition, in 1986, the State Health Department's testing of ASARCO slag identified radium in their samples.[31] The EPA cleanup program for ASARCO included a component to excavate slag driveways and other areas with small slag particles and replace this with gravel to minimize human exposure to the slag.[32] Obviously, this was not done for the mine roads on the Property. However, given Reserve's continuing efforts to convince King County to upzone portions of the Property to a Rural Residential zoning, to allow them to site a housing development on the Property, it would seem that all roads on the property should be tested for ASARCO slag, and for all toxic contaminants known to be associated with it (not just arsenic and lead), as part of the RI.

One final point of concern regarding the presence of ASARCO slag on the Property's roads: the RI description of the Plant Site identifies a "truck wash" on the Plant Site. This designation is quite vague and ambiguous. This facility is actually a truck wheel wash, where all trucks leaving the Property drive through this wheel wash to wash the dirt/dust/mud off the truck tires before entering the public Ravensdale-Black Diamond Road. This facility was mandated by King County Dept of Permitting and Environmental Review. Water for this facility is pumped from Ravensdale Lake. Our understanding is that the waste water from this wheel wash facility is pumped out of the wheel wash and to the Settling Ponds on the west end of the Plant Site Lot (presumably to the "Sedimentation Pond" in the SW corner).[33] It would seem that this process has the potential to serve as a direct pathway for slag, slag-mud and slag-dust to be transported from the Property roads south of the Ravensdale-Black Diamond Road, to the Settling Ponds north of the Road. And these Settling Ponds are in very close proximity to both Ravensdale Lake and Creek, and within a "Category 1 Critical Aquifer Recharge Area" for downstream public water supplies.[34] It would seem prudent to test the wheel wash facility, and the dump site for this wastewater in the Settling Ponds, for potential contaminants associated with ASARCO slag as part of the RI.

2.3 Ambiguity in Aspect's Recommendation of Lot 6 Being the MTCA "Site"

The draft RI recommends "*…the Site should be reduced from the full Property to Lot 6 or the portion containing the LDA and the area in which the leachate is discharging.*"[35] This recommendation seems ambiguous as to whether Aspect is recommending the MTCA "Site" should be the full Lot 6 (~67 acres), or should be limited to "*the portion* [of Lot 6] *containing the LDA and the area in which the leachate is discharging"* (~38 acres).

In our view, the **Dale Strip Pit** (DSP) should clearly be included in the "Site"; as we know CKD, a hazardous substance, was "*deposited, stored, disposed of, or placed, or otherwise come to be located*" in the DSP - thus qualifying it as part of the MTCA "Site". Including the remainder of Lot 6 would encompass the mine portal area (and water discharge site for both the former Dale #4 and Dale #7 underground coal mines), and the site of the extensive Dale Coal Co processing facilities (from 1925-1946). The draft RI provides essentially no evidence to support excluding these areas from the MTCA "Site".

With respect to the **portal area** and the water discharge from the portal: both the Dale #7 and Dale #4 underground mines from the late 1920's were "waterlevel" mines, whereby the groundwater entering these mines would flow downslope through the excavated mine tunnel and exit to the surface at the portal. The Dale #4 seam was surface mined to a depth of ~40'[36] in the late 1940's (depth of the underground mine was ~160' below the deepest surface mining level[37]), producing the DSP, which was filled with CKD (among other materials) in the 1980's. The RI states that bedrock wells below the DSP "*suggest that the historical mine workings are a groundwater discharge path for the bedrock system beneath the DSP."*[38] And further, "*There has been no evidence of COCs in groundwater that is collected within the underground coal mine workings that emerges through the north portal (based on testing by others at this location) suggesting that groundwater is not in contact with CKD in the DSP."*[39] Aspect thus concludes "*The DSP does not pose a risk to human health or the environment."*[40]

While these are most encouraging test results, and we certainly hope Aspect's conclusion is correct; the 'suggestion' that "*… groundwater is not in contact with CKD in the DSP"* would seem to conflict with the Robinson & Noble studies in 1985 and 1986 that concluded "*the water* [discharge from the mine portal] *was a blend of natural and CKD-impacted water*".[41] And the arsenic ratings from the MWB-1SDSP and MWB-5DSP Dale Strip Pit Bedrock wells in the DOE SHA in excess of MTCA Method A cleanup levels, also raise concerns about the robustness of Aspect's conclusion. Furthermore, the 'discharge path' provided by the mine tunnel for bedrock groundwater in the vicinity of the DSP to reach the surface, effectively defeats the natural barrier provided by the geologic fault "*expected to block any northerly movement of groundwater flow through north-south trending bedding plane fractures south of the fault."*[42] Given these uncertainties, and the huge challenges of dealing with CKD-contaminated groundwater (as proven by the LDA experience over the past 14 years), we believe the portal area, and the downgradient areas below the portal outflow, should remain part of the MTCA "Site".

The other area of concern within Lot 6 (but outside the DSP and the LDA-impacted area) is the **former processing site of the Dale Coal Company operations**, immediately south of the Ravensdale-Black Diamond Road, in the north end of Lot 6. There was a very large coal processing plant and numerous associated structures located at this site from 1925 through the late 1940's/early 1950's (see photo next page). This coal processing site included the coal washing, processing and sorting plants, coal bunkers, boiler house, machine and forge shop, oil house, powder house, pump house, winch house, warehouse, offices, and a briquette manufacturing plant, as well as other facilities.[43] It would seem that this site would have many of the same contamination risk elements as the Reserve Silica Plant Site - and possibly more. So if this portion of Lot 6 is to be considered for exclusion from the MTCA "Site", then it seems testing of this location for typical 1920's – 1940's industrial site contaminants should occur as part of the RI before this area is officially eliminated from the MTCA "Site".

Given the above arguments for including the DSP, the mine portal, and the Dale Coal Company processing site within the MTCA "Site" (as well as the likely slag-containing roads within this area), pending further investigation and testing, we strongly believe the "Site" should NOT be limited to just "*the portion* [of Lot 6] *containing the LDA and the area in which the leachate is discharging*", as suggested in the draft RI; but should include, at a minimum, ALL of Lot 6, including all of the Holcim Easement area (including the access road connecting the LDA and the DSP, which is required for Holcim to carry out their mandated management of the CKD).

Dale Coal Company, ca. 1925, looking south across Ravensdale Lake.

3.0 FURTHER INVESTIGATION NEEDED TO DEFINE EXTENT OF MTCA "SITE" (BEYOND LOT 6)

If one accepts that the "Site" includes all of Lot 6, and excludes the majority of the "Plant Site", this leaves ~300 acres of the Property that Aspect is recommending be excluded from the MTCA "Site". But no rationale is suggested in the RI to support this major recommended exclusion. And it would appear that there has been no testing whatsoever of these ~300 acres to justify such exclusion. Before the MTCA "Site" can be finalized, we'd suggest the following investigations should also be performed as part of the RI.

3.1 Other CKD-related contamination risks beyond Lot 6

While the draft RI clearly recommends that the LDA and leachate area encompassed by Lot 6 be part of the MTCA "Site", we strongly believe that, based on the definition (*"any area where a hazardous substance has been deposited, stored, disposed of, or placed, or otherwise come to be located."* [emphasis added]), the "Site" should also include those areas beyond Lot 6 where contaminated soil, groundwater and/or surface water is known, or might reasonably be suspected, to have migrated. This would clearly include the adjacent Baja property, where the infiltration ponds are primarily located, and where monitoring wells MW-5A and MW-6A have demonstrated ongoing pH and arsenic issues presumed to be driven by CKD in the LDA.

In addition, it would seem that additional testing should be required of the RI to determine if CKD-contaminated soil, ground, or surface water has spread to other portions of the Property, or to other adjacent properties. Of particular concern would be:

(a) The **settling ponds** portion of the Plant Site Lot – contaminated groundwater is clearly migrating this direction from the infiltration pond area (wells MW-5A and MW-6A). The RI states that most of the water recharge north of the BPA easement is via groundwater moving through the recessional outwash gravel.[44] The RI further assumes "*that Wetland A also receives recharge via groundwater,*"[45] and that "*Ravensdale*

Lake …. may receive a portion of groundwater from the LDA and infiltration ponds."[46] The Vashon recessional outwash gravels underlying the area between the infiltration ponds and Ravensdale Lake and Creek[47] are highly permeable, with a "High" Aquifer Susceptibility [to contamination] rating.[48] Kent Springs (for City of Kent water supply) and Covington Well Field (for Covington Water District water supply) are both downgradient from the infiltration ponds, ~2.4 miles. The infiltration ponds/settling ponds area is classified as a "*Category 1 Critical Aquifer Recharge Area and the entire Property is located within a 5-Year Wellhead Protection Area."*[49] In short, CKD-related contamination of the groundwater underlying the infiltration ponds, settling ponds and Ravensdale Lake and Creek, could represent an extremely high risk to human health. And the inferred north direction of groundwater flow in the vicinity of the Plant Site, as shown in RI Figure 4.1, is quite arbitrary,[50] and disagrees with prior studies indicating more of a NNW or NW flow direction. In spite of this high risk exposure, and the migration of CKD-contaminated groundwater in this general direction, AMW-1 is the sole test well in the entire ~50-acre settling pond area. And based on prior borings in this area, this well may not be representative of conditions within the settling ponds.[51] Given this sensitive exposure, it would seem an additional well between AMW-1 and AMW-2, as well as another well or two southwest of AMW-1, is needed to determine the current extent of contaminated groundwater, and for continued monitoring of this contaminant migration. Without these additional test wells, it is difficult to defend Aspect's conclusion that "*Groundwater samples collected from wells installed as part of the Plant Site RI suggest that the plume of elevated pH and increased concentrations of dissolved metals does not extend onto the Plant Site at concentrations of regulatory concern*."[52]

[Note: as a side concern, the DOE SHA indicates arsenic in MW-6A well at 41.60 in the February/May 2015 sample; but RI Section 4.4.1.3 indicates Golder sampling of MW-6A in Feb 2016 at 121, and in May 2016 at 199. What is the presumed source of this apparent **huge increase in dissolved arsenic**? And what are the implications of this significant increase in one year's time?]

(b) The **roadside ditches** along the Ravensdale-Black Diamond Road below the infiltration ponds, and along the Baja property – anecdotal reports indicate that stormwater standing in these ditches has killed the vegetation in the ditch in the past, and the presumed cause was contaminated toxic stormwater.

(c) The adjacent **Powell property** to the west (Powell is just south of Baja) – the RI reported that in 2004, Arcadis *"… concluded that preventing leachate generation* [from the LDA] *was not likely to be possible and recommended capture and treatment of the leachate instead."*[53] So the focus over the past 10+ years has been to divert surface and groundwater from coming into contact with the CKD, and to capture the leachate and dissipate it through infiltration ponds. But the RI also reports that "*Occasionally, leachate overfills the drainage ditch and flows, uncontrolled, over the ground surface to the west*"[54] i.e., toward Powell. And "*Water in the South Pond reportedly …. occasionally overflowed to the west*"[55] i.e., toward Powell. [Note, the RI concludes that the South Pond is "*supplied by precipitation and groundwater/leachate from the LDA.*"[56] And the DOE SHA shows the South Pond surface water to have arsenic, lead and pH levels far above MTCA cleanup levels.] This contaminated leachate below the leachate conveyance system has also been reported by others in the past.[57] And the arsenic and pH issues picked up in the Lower Haul Road borings (AB-10 thru AB-12), would also indicate a high risk of contaminate migration onto the adjacent Powell property. As such, it would seem that testing of the adjacent Powell property for CKD-contaminated ground and surface water should be a part of the RI, to define the extent to which "*a hazardous substance ….. has come to be located*", and thus to define the MTCA "Site".

In addition to known CKD in the DSP and LDA, there are also references to the possible dumping or spreading of CKD in other areas of the property as well. DOE's January 2016 Site Hazard Assessment alludes to this possibility, stating, "… *CKD might be present in other locations* [besides DSP and LDA…]" The RI references that in 2000, Tacoma Environmental Sciences, Inc found CKD (as well as melted glass, coal and ASARCO slag) "*in the LDA bank and base of the ditch at the west side of the lower haul road.*"[58] In addition, the discovery of "*Thin, interbedded layers of CKD*" in the upper two feet…, CKD "*mixed with sand/silty sand and coal fragments in soil to depths of 5.5 to 6.5 feet bgs* [below ground surface] *in* [RI] *borings AB-11 and AB-12"* …. "a*nd at a depth of approximately 11 feet*" bgs of the Lower Haul Road (RI borings AB-07, AB-11 and AB-12), which is adjacent to, but outside the LDA pit,[59] - would tend to confirm that CKD was likely spread/buried in other areas besides just the DSP and the LDA.

While we obviously don't know where such additional CKD dumping may have occurred, some likely locations for additional testing might include: (a) Lot 4 below the Lower Haul Road; (b) the east half of Lot 3 beyond the road connecting the Upper and Lower Haul Roads; (c) adits (air shafts, vents, test borings) for the Dale #7 underground mine on Lot 2 (just east of, and parallel to the DSP, see RI Figure 2-2); and the Settling Ponds area of the Plant Site Lot.

3.2 Other CKD-related Contaminants of Concern beyond arsenic, lead and pH

We did not locate any Laboratory Analytical Reports for the Lower Haul Road test borings (AB-5 through AB-12) in the RI, but it would appear from Aspect's summary table (Table 3), that the only tests performed on these soil samples was for arsenic and lead, plus pH for the three groundwater grab samples collected. Long-term monitoring results for surface and groundwater, as reported in the DOE Site Hazard Assessment, also monitor manganese, though we found no lab test results for manganese in this RI. Reserve's environmental consultant, GeoEngineers, reported in 2015 that analyses by the EPA indicate that CKD can also contain concentrations of thallium, antimony, chromium, total-2,3,7,8-substituted dioxins, and total hexachlorodibenzodioxin[60]. Other reports indicate that CKD may contain extremely carcinogenic dioxins and furans, especially when organic materials such as tires and medical wastes were used as a supplemental fuel sources in the cement kilns generating the CKD.[61,62] It is known that the Seattle Ideal/Holnam Cement plant, the source of the known CKD dumped at Ravensdale between 1979 and 1989, used tires as a fuel source for a period beginning in 1986.[63] This cement plant also tested the use of medical wastes as a fuel source,[64] though the exact time period when this testing occurred has not been discovered.

Given the extreme toxicity of some of these contaminants which are known, in some cases, to be associated with CKD, it would seem that the RI should include testing for these, as well as the arsenic, lead and pH currently being tested.

3.3 Other contamination risks besides CKD, ASARCO slag, and Plant Site industrial contaminants

Besides the potential Plant Site contaminants tested for in the RI, and CKD and ASARCO slag-related contamination, there are three other suspected contaminate risks that, it would seem, should be investigated as part of the RI, to determine the MTCA "Site" on the Property. These risk areas are (1) the
C1 Dale Coal Company coal processing site in the north of Lot 6; (2) the coal tailings pile in the north of Lot 1; and (3) the possible application of industrial-waste "fertilizer" products on the Property, especially on the eastern portion of Lot 3.

3.3.1 Dale Coal Company Coal Processing Plant

This potential contamination risk source was previously addressed in Section 2.3 of this report.

3.3.2 Coal Tailings

Prior studies commissioned by Reserve indicated the existence of ~ 10 acres of coal tailings in the north end of Lot 1.[65] This tailings pile was produced as a waste from the coal processing operations of the Dale Coal Company on this site between 1925 and 1946. Assessment of the contaminate potential of these tailings by GeoEngineers in 2015, under contract by Reserve, concluded that these tailings piles "*may result in contamination by heavy metals, carcinogenic polycyclic aromatic hydrocarbons (cPAHs), and other associated contaminants* ".[66] No evaluation of this potential source of contaminants seems to have been conducted as part of this RI. It would seem that this portion of the Property should not be excluded from the MTCA cleanup "Site" until such evaluation has been performed. Note also that Aspect encountered significant buried Coal Tailings in their test borings AB-1 through AB-4 on the Plant Site, just across the road from these tailings on Lot 1. But no soil samples appear to have been taken from the Coal Tailings strata under the Plant Site as part of the RI. Perhaps these buried coal tailings should also be tested for the potential contaminants identified by GeoEngineers, as part of the RI.

3.3.3 Industrial Waste "Fertilizers"

A third potential source of contamination on the Property is the possible use of industrial waste "fertilizer" on the forested portions of the property. Since 1972, three different operators on the Property (IMP, L-Bar, Ideal Cement) were aggressively pursuing disposal of industrial waste products through sale as a "fertilizer", and for other uses. Industrial Mineral Products (IMP), operator of the Property from 1972 to 1986 and headquartered in Ravensdale, also owned a magnesium recovery plant in Chewelah, Washington. During this period, IMP developed an agricultural fertilizer and road deicer "product" from the residue (Flux Bar Residue) of their magnesium recovery operation. IMP asked the Washington State University Agricultural Experiment Station in Puyallup to test this fertilizer product for use in western Washington.[67] [68] WSU declined to test the material. But it is unknown whether IMP may have tested this product on their own, on their Ravensdale Property.

With pending legal challenges relating to extensive contamination from ASARCO slag, IMP was dissolved in December of 1986, after selling all their assets, including the Ravensdale silica sand mining and CKD waste disposal operations, and the Chewelah magnesium recovery operation, to Reserve through Reserve's wholly-owned subsidiary, L-Bar Products, Inc. Through this transaction, Reserve also retained former IMP officers and staff who had been operating the Ravensdale Property for IMP. Following the buyout, Reserve (L-Bar Products), aggressively pursued the marketing of the Chewelah magnesium-waste "fertilizer" [69] (and road deicer [70,71]), under the brand names Cal Mag, Ag Mag, and Al Mag - with widespread sales between 1986 and 1991 to agricultural buyers throughout eastern Washington and the Willamette Valley. This was done legally by labeling the hazardous material as a "product," thus exempting it from hazardous waste disposal regulations.[72,73,74]

In 1991, concerns regarding the fertilizer's safety were raised,[75] with crop failures attributed to use of the fertilizer,[76] as well as complaints of soil sterilization and health issues and even death of animals fed agricultural crops that had been grown with this fertilizer.[77] An independent analysis of the fertilizer product characterized it as volatile, unpredictable, unsafe, and potentially poisonous to farmlands; and that advertising materials for this "fertilizer" were "*designed to deceive*."[78,79,80]

There are also indications that, like their predecessor IMP, Reserve/L-Bar was pushing to gain a market for this magnesium-waste "fertilizer" in western Washington (possibly for use as a forest fertilizer). As with IMP

before them, there is reason to suspect Reserve/L-Bar may have "tested" this fertilizer on some of the forests on their Ravensdale Property.

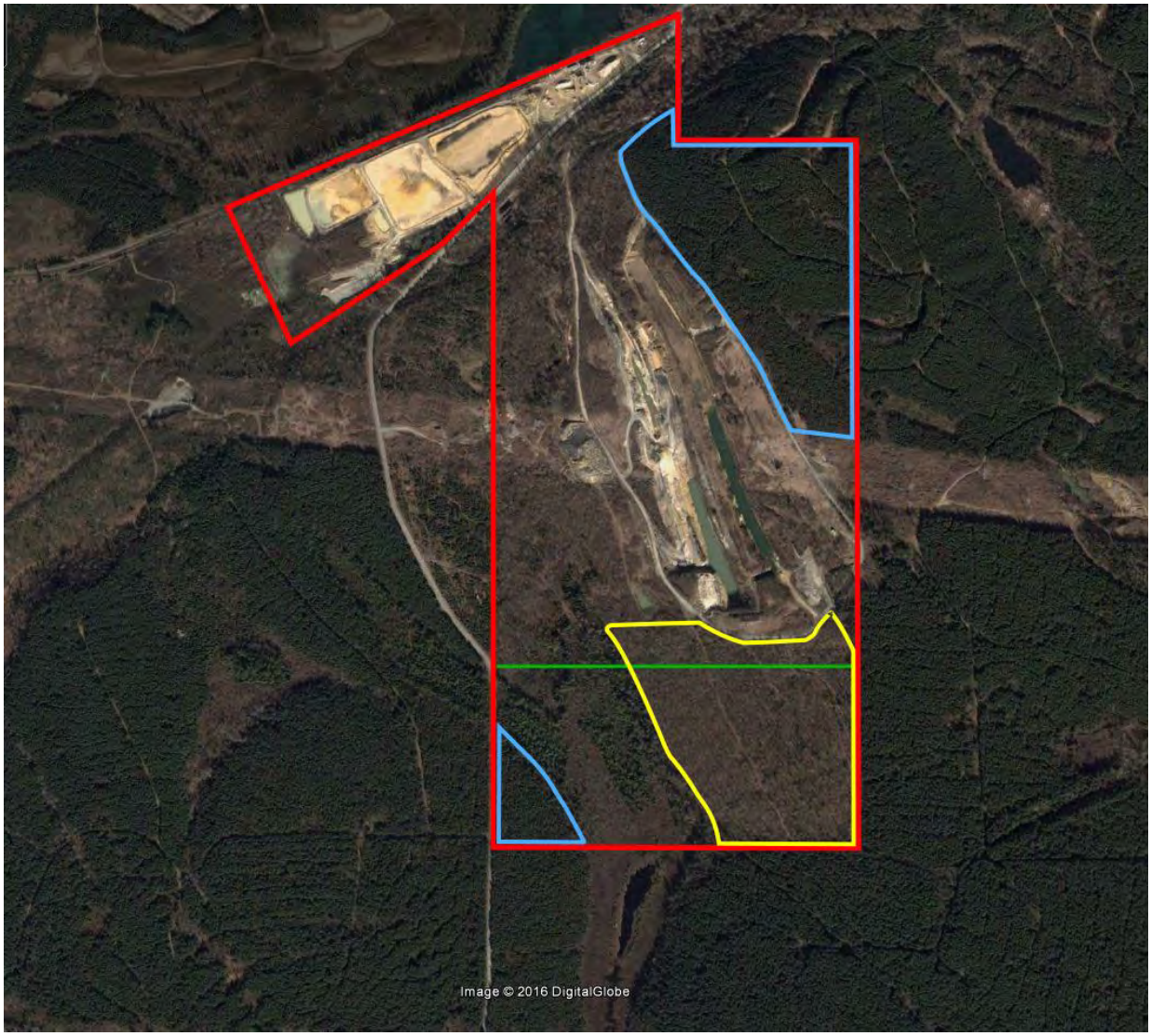
In addition to the magnesium-waste fertilizer risk, there is some potential that CKD may also have been spread across forested portions of the Property as a fertilizer/liming agent. Ideal Cement in Seattle, had an arrangement whereby they would purchase ASARCO slag and Ravensdale silica sand from IMP for use in their cement manufacturing. Ideal Cement in turn, would then dispose of their CKD wastes in the Ravensdale DSP and LDA mine pits. This arrangement was in effect from 1979 until the Reserve buy-out in 1986. Ideal would continue to dispose of CKD in Reserve's DSP pit until 1989. But by 1987, the majority of Ideal's CKD wastes were being sold as a liming agent/fertilizer product for agricultural use in western Washington,[81] [82] [83] with the remainder being disposed in the DSP through 1989.

It would be reasonable to suspect that during the 1986 – 1989 period, Reserve and/or Ideal may have tested this CKD liming agent product on some of the forests on the Ravensdale Property, to reduce the natural acidity of the forest soils and improve timber growth. If such use were to have occurred, other portions of the Property besides the DSP and the LDA may exhibit CKD-related contamination as well. Apparently, no testing for CKD outside the DSP and LDA has occurred. Aspect's RI borings in the Lower Haul Road to test for ASARCO slag, however, did discover the presence of CKD in 3 of the 8 borings.

Potential evidence that some kind of unique treatment, perhaps a "fertilizer" test, on portions of the Property sometime during the late 1970's or 1980's period, is the very apparent anomaly in the condition of the forest in the east half of Lot 3 compared to the forests on Lots 1 and 2, and to the forests on adjacent properties. This anomaly can be clearly seen on the April 2002 Google Earth aerial image below. These forests were all owned and managed by Burlington Northern Timberlands (BNT), and were all clearcut harvested and replanted in the 1980's. The RI[84] confirms prior statements by Reserve, that they have done no forest management activities on any of these lands during their tenure (since 1986). And yet, this timber stand on the east of Lot 3 is dramatically different in character from the other undisturbed forests on the property, and from the adjacent surrounding forests – in spite of apparently the same harvest and planting management and soil conditions. This dramatic difference was also identified in prior Reserve-sponsored studies by International Forestry Consultants (Feb 2012) and American Forest Management (May 2016). Might a "test" application of a magnesium-waste "fertilizer" or a CKD-liming agent by IMP, Reserve/L-Bar, and/or Ideal Cement account for this dramatic difference in forest conditions? The eastern portion of Lot 3 would seem to be an ideal location to perform such a test, as it has gentle topography, easy access, and is outside the prospective mining area (and has remained zoned Forestry and included within the Forest Production District, unlike most of the Property which is zoned Mining). And the forests on Lots 1 and 2 would provide a perfect "control" to monitor the impact of a fertilizer test.

At this point, the possible use of one or more of these industrial waste "fertilizer" products on the Property is pure speculation. But it would seem there is enough circumstantial evidence to warrant testing for contaminants known to be associated with Cal Mag/Ag Mag/Al Mag and CKD-based fertilizer/liming agent as part of the RI. While we don't know what Contaminants of Concern may be associated with the magnesium waste fertilizers, presumably this could be found in the court case documents relating to this litigation (Case #91-1345CV, *Behrman v. L-Bar*, Circuit Court of Oregon, Washington County, Hillsboro, OR). Alternatively, WDOE was integrally involved, along with US EPA, in the litigation against L-Bar Products in 2000, regarding

cleanup of the Magnesium flux bar residue from the Chewelah site [85] and other legal actions. [86,87] So DOE may already have internal information on the contaminants present in this material.



April 2002 Google Earth image showing the dramatic vegetation difference between the heavily timbered northeast and southwest areas (highlighted in blue) and the southern portion upland of the wetlands (highlighted in yellow). Also note the heavily timbered lands surrounding the Reserve Silica property that were harvested and replanted by BN Timberlands at about the same time as the timber stands of the Reserve property. The lands below the green line and to the east are zoned Forest and located within the Forest Production District. (Google Earth, ©2016.)

If such "fertilizer" tests were determined to have been performed on Lot 3, indicating another potential source of COCs on the Property, this raises another series of additional concerns. While previous studies have concluded (and this RI confirms), that groundwater originating from north of the BPA powerline tends to flow in a northerly to northwesterly direction, groundwater originating south of the BPA powerline (e.g., Lot 3) tends to drain in a southwesterly direction, "*to Wetland B, which eventually discharges to Sonia Lake and Ginder Lake to the south of the Property.*"[88] As such, if testing confirms a contamination source present on Lot 3, then additional testing should also check for potential migration of such contamination to the southwest and Wetland B.

3.4 Other Untested Areas and Contaminants

This Property has a very long history as a dumping/disposal site in the County, partly due to its remoteness from urban areas, and partly due to the presence of coal and sand mining pits, shafts and tunnels – which provide what appeared to be ideal disposal sites for various wastes. In addition to the CKD, ASARCO slag, coal tailings and possible industrial waste "fertilizer" contamination risks on the Property, there are also other locations on the Property that have not been tested for possible contamination, but which may well have received contaminated wastes over the site's 90-year operating history. In addition, there are likely other hazardous wastes that have been dumped on the Property, either legally or illegally, but for which we have no documentation.

There was undoubtedly some level of undocumented dumping on the Property during the early coal mining days (1899-1915), the Dale coal mining days (1926-1946), and the early sand mining days (1968-early 1970's). Other than the abandoned coal mines and their associated surface portals and adits, it would be hard to even guess the locations of such dumping. But we know the Property has operated as a fill site at least since 1971,[89] through backfilling of the surface coal and sand mining pits, with both known and unknown materials.[90] In addition to CKD and borrow (mixtures of soil, sand and/or gravel), the RI indicates "*other materials, which may have included clay-rich till and mining wastes and/or rejected clay and sand batches and glass cullet*"[91] and "*clay and fine sand from the settling ponds*"[92] and other *"non*-CKD" material was deposited in the DSP. The RI states that "*Reclamation and landfilling have been conducted under county grading permits since 1971,…"*[93] Filling of the entire Upper Pit, and portions of the North and Lower Pits, apparently occurred under various County grading permits issued by KC-BLD, KC-DDES, and KC-DPER. Filling of the North and Lower Pits continued under solid waste landfill permits issued by SKC Public Health; [94] which allowed dumping on the site consistent with a landfill.[95] The DOE reportedly had the site "listed *as a landfill until December 1999*."[96] Consistency of early-day fill monitoring for permit compliance is unknown, but was likely not always reliable. [97] The RI indicates "*There are verbal accounts of acceptance of soil during active sand mining in the 1980s, maybe as a courtesy to customers. Full trucks would arrive and Reserve Silica would allow them to dump their load of soil before being filled with sand.*" [98] This dumping may well have included unpermitted materials. Finally, in July 2012, SKC Public Health issued an Inert Waste Disposal Permit[99] that specified only soil material free of contaminants, radioactive and hazardous wastes could be dumped on the site. Prior to issuance and monitoring of this inert waste permit in 2012, it is largely unknown what other waste materials may have been dumped at the site.[100] This view is corroborated in WDOE's Site Hazard Assessment from January 2016, where they state that other sand mining pits "*were filled with unknown materials not expected to be CKD*".[101] The filling of the North and Lower Pits continues to today under the SKCPH inert waste permit.[102]

Aspect asserts that "*Based on the conditions of the permit(s) for the Inert Waste Landfill (and interim actions completed to remain consistent with those permits) it is* ***assumed*** [emphasis added] *that the Inert Waste Landfill areas* [i.e., Upper, North and Lower Pits]… *were filled as required through the conditions of the permit.*"[103] Based on this assumption, they claim the Inert Waste Lot (Lot 5), which encompasses these three sand mining pits, should be excluded from the MTCA "Site".

It seems that the issuance by SKCPH of the Inert Waste Permit in 2012, and the relatively diligent monitoring for dumping compliance with this permit since 2012, should give us some confidence that materials dumped in these three pits since 2012 are unlikely to constitute a hazardous waste contamination risk. [Some tests on the known dumping of debris from the 520 bridge demolition work at this site in 2016 do raise questions

about this validity of this assumption.] However, the unknown, and likely loosely-monitored dumping in these pits prior to 2012, likely pose a potential risk. It would seem that Aspect's assumption of permit compliance as the basis for excluding the Inert Waste Lot (Lot 5) from the MTCA "Site" should be validated through additional testing in the RI.

Given the unknown character of some of the fill material used in the early days for filling the mine pits, it's uncertain what COCs should be tested for. We presume DOE has a list of COCs commonly associated with landfills. Combined with the expanded list of CKD-related COCs described previously, such testing would hopefully identify any toxic contaminants associated with these other unknown and undocumented fill sources.

Two other areas which might also be suspected of having received undocumented dumping in the early days are:

(a) The Dale #7 underground coal mine network, with its associated surface adits (airshafts, vents, test borings, etc.) - the DSP was the strip mining of the Dale #4 seam; the Dale #7 (underground, never strip mined) lies just east of, and parallel to the DSP, on Lot 2 – see RI Fig 2-2. It would seem that the RI should locate and check the surface adits to this underground mine for unauthorized waste disposal.

(b) Settling ponds portion of the Plant Site Lot – this area would seem to be a logical area to have received undocumented dumping, either during the Dale Coal Co days (1925 – 1946), or during the early sand mining days (1968 – early 1980's). The single test well, AMW-1, in the extreme SE portion of this area would not appear to constitute adequate testing for potential contaminants to justify exclusion of this entire area from the MTCA cleanup "Site".

It would seem that a comprehensive RI should at least address these other potential sources of contamination described above.

4.0 OTHER MISCELLANEOUS ISSUES / CONCERNS / COMMENTS

RI Section 2.3.3 Environmental Setting/Forestry: While Aspect has correctly quoted conclusions from the prior studies done by American Forest Management and International Forestry Consultants, the implication left from Aspect's write-up is that the Property is not suitable for forest management. This conclusion has been demonstrated to be invalid, and this "unsuitable for forestry" conclusion has been rejected by both the King County Executive, and by the King County Rural Forest Commission. The majority of these lands are indeed suitable for long-term commercial forest management.

RI Figure 2-2 Historical Coal Mining Map: Note that while this map appears to do a pretty good job of displaying the extent of the Dale #4 and Dale #7 underground mines on the property, the extent of underground mining underlying the north portions of Lots 1 and 6 by the Northwestern Improvement Company prior to 1915, are significantly understated in this Figure.

RI Section 2.3.5 Environmental Setting/Groundwater Use: While Aspect's summary of groundwater use within 2 miles of the site appears correct, the major concern relates to potential contaminant migration which could threaten the large public water supply sources serving the City of Kent and the Covington Water District, just ~2.4 miles downgradient from the Property and the infiltration ponds. (Also of concern could be

the water wells providing drinking water to the Maple Ridge Highlands housing development,[104] ~ ½ mile NW of the Reserve Property.) It seems this major risk area (i.e., Kent and Covington well fields) should be included within the RI write-up, even though it is outside the 2-mile radius.

RI Figure 2-7 Geologic Cross Sections: the "Tan Pit" appears to be referenced in this Figure. The "Tan Pit" is also referenced in the January 2016 DOE SHA. But this sand mine pit doesn't seem to be referenced anywhere in the narrative of the RI (that we could find). And it isn't shown on any of the RI maps that label the various mine pits. One would presume this pit would have been described in RI Section 2.2.3, 2.2.4, and/or 3.2. Where is this pit located? When, and with what material, was it filled?

RI Section 4.4.1 Field Investigations/Remedial Investigation/Plant Site Investigation: water sample RSRL-033017 was "*obtained from Ravensdale Lake to support a water rights evaluation".* The lab test results from this sample (RI Appendix E, first set of results, page 37), shows dissolved calcium, magnesium and sodium above PQL levels. There apparently are no MTCA Method A cleanup levels specified for these metals. Do these results imply a level of contamination of Ravensdale Lake? Is this an issue? Do any of the other lab results on this sample (first set of results in Appx E, pages 22, 24, 26, 28) raise any issues re: potential contamination of Ravensdale Lake? The Lake is reportedly fed by springs under the Lake, which are apparently sourced by groundwater originating south of the Lake, potentially including Reserve's Property.

RI Section 5.1 Conceptual Site Model/Contaminants of Concern: 'dissolved lead in surface water' should also be listed as a COC, based on DOE January 2016 Site Hazard Assessment findings.

RI Limitations: This "Limitations" disclaimer states "*All reports prepared by Aspect Consulting for the Client apply only to the services described in the Agreement(s) with the Client.*" It would be helpful to review the terms of the Agreement between Aspect and Reserve for this RI. A prior environmental assessment contract between Reserve and GeoEngineers (July 2015) appeared to have been structured such that Reserve maintained a very strong level of control over the issues addressed by the consultant, the nature of the analysis to be performed, and even the data/information provided to the consultant to perform the analysis. These restrictions and the resulting limitations were alluded to in multiple locations in that consultant's report.[105] It is interesting that this prior report, which is very applicable to this RI, is not included within the very extensive list of references, bibliography list, or the extensive "*Property Environmental Reports of Significance*" in Appendix C of this RI – even though the Aspect authors indicated they were fully aware of this report. [Note: we have a copy of this 13-page report if you should desire a copy.] It would be comforting to know that the Agreement between Aspect and Reserve for this RI gave Aspect complete independence to structure and perform the RI analysis; gave Aspect complete access to all Reserve data, reports, etc. which are likely to have a material influence on the RI results (including reports that are unfavorable to Reserve's mining, landfilling and reclamation activities); and that the Conclusions and Recommendations from this RI are totally Aspect's, with no pressure, coercion or influence from Reserve.

5.0 SUMMARY OF OUR COMMENTS ON DRAFT RI

We believe the current draft RI does an inadequate job of both identifying COC's which might reasonably be expected on the Property, and in assessing the extent of possible contamination – i.e., defining the "Site". We believe ongoing efforts to assess the nature and extent of the contamination attributable to CKD in the LDA must be completed before a final determination of the MTCA cleanup "Site" can be made. We also believe there are several other areas of the Property, besides Lot 6, the Plant Site, and the Lower Haul Road,

on which Contaminants of Concern (COCs) are reasonable to suspect. In addition, we believe that there are other COCs, beyond those reported in this draft RI, that may well be expected on this site. We feel these outstanding issues should be addressed as part of the RI before the MTCA "Site" can be defined. As such, we disagree with Aspect's recommendation that *"…the Site should be reduced from the full Property to Lot 6 or the portion containing the LDA and the area in which the leachate is discharging.*" (I.e.: basically just that area being managed by Holcim (US) Inc.) And, as a Potentially Liable Party, we believe Reserve Silica, and their parent company, Reserve Industries, should not be released from liability or responsibility before the Remedial Investigation, Feasibility Study, and Cleanup Action Plan are finalized.

REFERENCES AND NOTES

[1] RI Executive Summary, paragraph 1
[2] RI Executive Summary, paragraph 3
[3] RI Executive Summary, paragraph 1
[4] The RI consistently quotes the total Property as being 377 acres, but other Aspect maps, and County information indicate a total of 382 acres for the Property
[5] RI Executive Summary, paragraph 3
[6] RI Section 6.1
[7] RI Section 4.3, point #1
[8] RI Executive Summary, paragraph 2
[9] RI Section 4.4
[10] RI Section 4.4.1.3
[11] RI Section 4.4.2.2
[12] RI Executive Summary, paragraph 3
[13] RI Executive Summary, last paragraph
[14] RI Section 4.3, last paragraph
[15] RI Executive Summary, paragraph 3
[16] RI Section 4.4.1.3
[17] RI Section 4.4.1.3
[18] RI Table 2
[19] RI Appendix E, Lab Results, second set of lab results, pages 27-28; and RI Table 2
[20] RI Appendix E, Lab Results, first set of lab results, sample RSRL-033017, page 37; also note: magnesium PQL is listed as 1100, is this correct? Or should it be 11,000?
[21] RI Section 4.4.2.2 and RI Figure 4-3
[22] Note that we did not locate any lab test results for these samples in Appendix E. Based on RI Table 3, it appears only arsenic and lead were tested for
[23] RI Section 6.1, paragraph 2
[24] USEPA. *The Asarco Tacoma Smelter Superfund Projects: A Brief Overview.* 1994. http://nepis.epa.gov/
[25] RI Section 4.4.2.2
[26] RI Table 3
[27] Lave, Lester B., ed. *Risk Assessment and Management: The Proceedings of the Annual Meeting of the Society for Risk Assessment, November 1985.* Springer Science & Business Media, 1987. https://books.google.com/books
[28] WDOE. *Toxics Cleanup in Commencement Bay: A Changing Environment and a Toxic Legacy*. http://www.ecy.wa.gov/
[29] USEPA. *The Asarco Tacoma Smelter Superfund Projects: A Brief Overview.* 1994. http://nepis.epa.gov/
[30] WDOE. *Lower Duwamish Waterway: Cement Kiln Dust: Summary of Existing Information.* April 2015. Lower Duwamish Waterway - Cement Kiln Dust: Summary of Existing Conditions
[31] EPA grant report F5C3052, Game Without End: politics, pollution, public health and the Tacoma smelter, Marianne Sullivan, Columbia University, 2009, pg 320; as reported in March 2013 letter from Middle Green River Coalition to King County Council.
[32] USEPA. *The Asarco Tacoma Smelter Superfund Projects: A Brief Overview.* 1994. http://nepis.epa.gov/
[33] RI Section 3.1.1
[34] RI Section 2.3.2
[35] RI Executive Summary, paragraph 3
[36] RI Section 3.1.2
[37] RI Figure 2-7
[38] RI Section 3.1.2
[39] RI Section 5, paragraph 5

[40] RI Section 3.1.2
[41] RI Section 3.1.2
[42] RI Section 5, pg 31 last paragraph
[43] Blanket Insurance listing of Dale Coal Company buildings and equipment at Dale plant site, Dec 1941-Jun 1943; from Northern Pacific archives, Location 137.I.13.1B; #1567, Aug 10, 1945
[44] RI Section 2.3.4
[45] RI Section 2.3.4
[46] RI Section 5, Valley Fill bullet
[47] RI Section 2.4, and Hart-Crowser, City of Kent, Wellhead Protection Program – Clark, Kent, and Armstrong Springs, April 2, 1996.
[48] Aquifer data in this paragraph from Hart-Crowser, City of Kent, Wellhead Protection Program – Clark, Kent, and Armstrong Springs, April 2, 1996.
[49] RI Section 2.3.2
[50] RI Section 4.4.1 – AMW-1 was installed "*to evaluate groundwater quality in the **presumed*** [bold added] *downgradient direction of monitoring wells located at the Infiltration Ponds*". Note that assumed direction of groundwater elevation lines in Figure 4-1, which support the North groundwater flow assumption, are very arbitrary, and seem to be inconsistent with prior studies by Hart-Crowser (City of Kent, Wellhead Protection Program – Clark, Kent, and Armstrong Springs, April 2, 1996) and others, that would indicate a more northwesterly flow direction.
[51] It also seems strange that the characteristics of the AMW-1 well drilled for the RI are so substantively different from prior borings done in the Settling Ponds area. RI 3.4.1 indicates soil borings were done in the Settling Ponds area in 2002 & 2005/6. These borings ranged in depth from 46 – 62'; encountered groundwater at 35 – 51' bgs; and encountered glacial till at 45 – 55' bgs. The RI well log for AMW-1 was bored to 41.5' depth, encountered static groundwater at 20', and glacial till (recessional outwash) at 37'. These substantial differences between the RI well and prior borings raises concerns regarding the representativeness of the AMW-1 well.
[52] RI Section 5, paragraph 6
[53] RI Section 3.1.1
[54] RI Section 3.1.1
[55] RI Section 2.3.4
[56] RI Section 3.1.1
[57] Public Health-Seattle, King County. 2014. "Routine Inspection/Field Review of a Closed Landfill." Inspection; as reported by GeoEngineers. *Preliminary Environmental Conditions Letter Report, July 22, 2015.* Reserve Silica Demonstration Project Proposal, May 1, 2016, Appx. K, pg. 5; as well as others e.g., GeoEngineers, July 22, 2015
[58] RI Section 2.2.4, Roadway Areas
[59] RI Section 4.4.2 and Figure 4-3.
[60] GeoEngineers. *Preliminary Environmental Conditions Letter Report, July 22, 2015.* Reserve Silica Demonstration Project Proposal, May 1, 2016, Appx. K, pg. 5.
[61] Montana State Supreme Court. Minutes of the Montana Senate, Committee on Natural Resources, February 15, 1993: Exhibit no. 6. Montana State Supreme Court
[62] *WDOE. Lower Duwamish Waterway – Cement Kiln Dust: Summary of Existing Information. April 2015.* Cement Kiln Dust: Summary of Existing Information - Washington State ...
[63] USEPA. *Burning Tires for Fuel and Tire Pyrolysis: Air Implications.* http://nepis.epa.gov/
[64] WDOE. *Washington State Dioxin Source Assessment.* July 1998. https://fortress.wa.gov/ecy/
[65] International Forestry Consultants, Reserve Silica Ravensdale Property Forest Analysis, Feb 13, 2012.
[66] GeoEngineers. *Preliminary Environmental Conditions Letter Report, July 22, 2015.* Reserve Silica Demonstration Project Proposal, May 1, 2016, Appx. K, pg. 4.
[67] Spokesman-Review. *State Refuses Use of Quarry as Waste Site.* November 30, 1983. https://news.google.com/newspapers
[68] Chemical & Engineering News. *Hazardous Waste Finds Use as Low-cost Fertilizer.* December 24, 1984. http://www.sciencemadness.org/

[69] Seattle Times. *Fear in the Fields, Part I: How Hazardous Wastes Become Fertilizer – Spreading Heavy Metals On Farmland Is Perfectly Legal, But Little Research Has Been Done To Find Out Whether It's Safe.* July 3, 1997. http://community.seattletimes.nwsource.com/ Also, link to entire Duff Wilson Seattle Times *Fear in the Fields* series and book, Fateful Harvest can be found at http://www.bioethicscourse.info/

[70] US Patent 4692259 A. 1986-87. *Water-Activated, Exothermic Chemical Deicing Formulations*. http://www.google.com/patents/US4692259. Patent application notes that the deicing product can also be used as fertilizer.

[71] Justia Patents. Patents by Inventor Ronald J. Roman. http://patents.justia.com/inventor/ronald-j-roman

[72] Seattle Times. *Fear in the Fields Part II: How Hazardous Wastes Become Fertilizer – Lack of Fertilizer Regulation in U.S. Leaves Farmers, Consumers Guessing About Toxic Concentrations on Farms.* July 4, 1997. http://community.seattletimes.nwsource.com/ Also, link to entire Duff Wilson Seattle Times *Fear in the Fields* series and book, Fateful Harvest can be found at http://www.bioethicscourse.info/

[73] Wilson, Duff. Fateful Harvest: The True Story of a Small Town, a Global Industry, and a Toxic Secret. HarperCollins, New York. 2001.

[74] Chemical & Engineering News, December 24, 1984. *Hazardous Waste Finds Use as Low-cost Fertilizer*. http://www.sciencemadness.org/

[75] Spokane Chronicle. *Dispute Ends With Removal of Fertilizer.* October 9, 1987. https://news.google.com/newspapers

[76] Seattle Times. *Fear in the Fields, Part I: How Hazardous Wastes Become Fertilizer – Spreading Heavy Metals On Farmland Is Perfectly Legal, But Little Research Has Been Done To Find Out Whether It's Safe.* July 3, 1997. http://community.seattletimes.nwsource.com/ Also, link to entire Duff Wilson Seattle Times *Fear in the Fields* series and book, Fateful Harvest can be found at http://www.bioethicscourse.info/

[77] Wilson, Duff. Fateful Harvest: The True Story of a Small Town, a Global Industry, and a Toxic Secret. HarperCollins, New York. 2001.

[78] Seattle Times. *Fear in the Fields, Part I: How Hazardous Wastes Become Fertilizer – Spreading Heavy Metals On Farmland Is Perfectly Legal, But Little Research Has Been Done To Find Out Whether It's Safe.* July 3, 1997. http://community.seattletimes.nwsource.com/ Also, link to entire Duff Wilson Seattle Times *Fear in the Fields* series and book, Fateful Harvest can be found at http://www.bioethicscourse.info/

[79] Logansport Pharos-Tribune. *Alcoa Building Own Plant To Use Waste In Fertilizer.* August 6, 1997. https://www.newspapers.com/

[80] More information can be found in Case #91-1345CV (*Behrman v. L-Bar*), Circuit Court of Oregon, Washington County, Hillsboro, OR as referenced in Duff Wilson's book, Fateful Harvest.

[81] USEPA. *Report to Congress on Cement Kiln Dust.* December 1993. http://nepis.epa.gov/

[82] *WDOE. Lower Duwamish Waterway – Cement Kiln Dust: Summary of Existing Information. April 2015.* Cement Kiln Dust: Summary of Existing Information - Washington State DOE

[83] WDOE. Washington State Dioxin Source Assessment. Pub. No. 98-320. July 1998. https://fortress.wa.gov/ecy/

[84] RI Section 3. Note that RI Section 3.6.1 indicates extensive investigation and rotary percussion drill holes to 82' deep in SE corner of Lot 3 were bored for exploration into potential expansion of surface silica sand mining in 2003. But the Google Earth image demonstrating the unique characteristics of this timber stand was from April 2002 – before this "exploration" work occurred.

[85] WDOE. *L-Bar Site Cleanup Action Plan Agreed Order.* June 2000. https://fortress.wa.gov/ecy/

[86] Spokane Chronicle. *L-Bar Investigation Just Latest In Series Of Cleanup Problems.* June 26, 1992. https://news.google.com/newspapers

[87] WDOE. *L-Bar Site: Agreed Order No. DE 94TC-E104*. January 5, 1995. Department of Ecology - Access Washington

[88] RI Section 2.3.4

[89] RI Section 2.2.4, and GeoEngineers. *Preliminary Environmental Conditions Letter Report, July 22, 2015.* Reserve Silica Demonstration Project Proposal, May 1, 2016, Appx. K, pg. 7.

[90] GeoEngineers. *Preliminary Environmental Conditions Letter Report, July 22, 2015.* Reserve Silica Demonstration Project Proposal, May 1, 2016, Appx. K, pg. 7. Also RI Section 4.3, bullet #2

[91] RI Section 2.2

[92] RI Section 2.2.4

[93] RI Section 2.2.1

[94] RI Section 2.2.4 and 3.1 and GeoEngineers. *Preliminary Environmental Conditions Letter Report, July 22, 2015.* Reserve Silica Demonstration Project Proposal, May 1, 2016, Appx. K, pg. 7.

[95] GeoEngineers. *Preliminary Environmental Conditions Letter Report, July 22, 2015.* Reserve Silica Demonstration Project Proposal, May 1, 2016, Appx. K. pgs. 2 and 8.

[96] Environmental Data Resources report, Phase I Environmental Site Assessment; as reported in GeoEngineers. *Preliminary Environmental Conditions Letter Report, July 22, 2015.* Reserve Silica Demonstration Project Proposal, May 1, 2016, Appx. K, pg. 7.

[97] We have documentation, as recent as 2016, of numerous instances of unpermitted material being dumped on the property adjacent to Reserve, under King County Department of Permitting and Environmental Review (DPER) filling and grading permits which were supposedly being "monitored" by the same DPER inspector as was responsible for monitoring the Reserve Property for the last decade. In only one case over the past six years did DPER require the adjacent landowner to remove this unpermitted material.

[98] RI Section 3.2

[99] RI Section 3.2

[100] GeoEngineers. *Preliminary Environmental Conditions Letter Report, July 22, 2015.* Reserve Silica Demonstration Project Proposal, May 1, 2016, Appx. K, pg. 7.

[101] WDOE. Reserve Silica Site Hazard Assessment, Worksheet 1. January 2016. https://fortress.wa.gov/ecy/

[102] RI Section 2.2.4 and 3.1 and GeoEngineers. *Preliminary Environmental Conditions Letter Report, July 22, 2015.* Reserve Silica Demonstration Project Proposal, May 1, 2016, Appx. K, pg. 7.

[103] RI Section 5, 2nd paragraph

[104] RI Section 2.3.5

[105] GeoEngineers. *Preliminary Environmental Conditions Letter Report, July 22, 2015.* Reserve Silica Demonstration Project Proposal, May 1, 2016, Appx. K.

Attachment 5

Assessment of Reserve Silica's Proposed Mining Site Conversion Demonstration Project
prepared by Michael and Donna Brathovde for
Friends of Rock Creek Valley, August 2016

Attachment 5

No Specific Comments; see other Attachments for similar discussion and their comments

Assessment of Reserve Silica's Proposed Mining Site Conversion Demonstration Project

In Response to Proposals Distributed by Reserve Silica dated April 6, 2016 and May 1, 2016

Prepared by Michael & Donna Brathovde
for the Friends of Rock Creek Valley
August 2016

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1.0 EXECUTIVE SUMMARY, QUESTIONS AND SHORT ANSWERS

1.1 Executive Summary: Response to Reserve Silica Proposal

Reserve Silica's request to upzone their Ravensdale property to a Rural Residential land use, rather than revert to the Forestry designation current code would dictate, is based on a grossly erroneous assertion that to reclaim the majority of the property for forestry use would require "*significant and impractical investment*", and that this property does not satisfy the definition of '*forest land of long-term commercial significance*' based on either GMA or King County definitions. Our analysis, based on data and forestry reclamation practices recommended by Reserve's consultants, indicates that the costs to reclaim ~70% of the property for forest use would run on the order of $70,000; and the NET value of harvesting the existing 73 acres of mature Douglas-fir timber on the property, including replanting following harvest, should yield something near $400,000. So the assertion of an 'impractical' forest reclamation cost is totally incorrect. To put these forestry costs and revenues into perspective, our estimate of the net value to Reserve if their property were to be upzoned to RA-10 and they are approved to put in a 72-unit clustered 'rural community', is on the order of $1,700,000. Clearly, the driving force behind their push to upzone to rural residential is the desire to capture this residential-lot sale windfall, NOT to avoid 'impractical' forestry reclamation costs as they contend.

Reserve's proposal also fails to mention that the WA Department of Ecology did a Site Hazard Assessment in January 2016, and classified the site as a Class 1 (highest priority) MTCA toxic waste clean-up site, with a Human Health Risk rating of 4.4 (on a 1 – 5 scale, where 5 is extreme risk). These ratings are based on documented contamination of soil, surface and ground water from ~350,000 tons of hazardous Cement Kiln Dust (CKD) that was dumped in unlined pits on the property from 1979 – 1989. Though these pits have been capped since ~2003, all efforts to date to contain the contamination of surface and groundwater leaching from the site over the past fourteen years have failed, and contaminated waters, up to 30X MTCA Cleanup Levels (CUL) for arsenic, and 2X MTCA CUL for lead, with pH levels up to 13.02 (classifying the water as an RCRA 'corrosive waste', which is capable of causing significant burns on contact with humans or animals) is now beyond all interception and monitoring facilities, and has migrated off-site, over 800' from the closest CKD disposal area. And this highly contaminated ground and surface water is now less than 800' from Ravensdale Lake and Ravensdale Creek, with both the Kent Springs and Covington Soos Creek well fields downgradient from this point.

DOE Water Quality personnel believe this as yet uncontrolled ground and surface water would represent a significant human health hazard risk to nearby residents; and that the ~10 million gallons/year of incremental groundwater from septic systems for a 72-unit development, sourced with public water from off-site, could substantially exacerbate the ongoing efforts to try to control the CKD contamination. In addition, there are other toxins commonly associated with CKD that have not been tested for; and there is considerable evidence that other areas of the property may well contain other contaminates, for which no testing has been done.

The proposal also does NOT meet ANY of the five criteria specified in Policy I-203 (2012 KCCP) to qualify as a mining site conversion Demonstration Project. Furthermore, as proposed, the project would violate

at least 20 existing, long-standing County Policies, resulting in a 72-unit 'rural community' island, 1.4 miles outside the Urban Growth Boundary, totally surrounded by over 3,500 acres of FPD, Natural Area and Open Space lands which allow NO residential development whatsoever. The nearest public water supply needed to service this development is ~ 1.5 miles distant.

The Development Agreement; Conservation Easement; and Covenants, Conditions and Restrictions proposed by Reserve Silica are collectively structured to shift responsibility and liability from Reserve to a future Homeowner Association and to King County, while retaining Reserve's right to extract additional value from the property through future timber harvest and residential lot sales.

In summary, this site is <u>NOT</u> suitable for residential development. To approve such a use would expose King County to a substantial risk of future litigation from property residents and others. And contrary to Reserve claims, the majority of the property <u>IS</u> suitable for reclamation for forestry use, at very reasonable costs. As such, the Council should reject Reserve Silica's Demonstration Project proposal, revert the designated Land Use of the property to Forest and the zoning to Forestry and retain the property within the FPD; work with Reserve to develop a final reclamation plan that will reestablish viable forests on the majority of this property; and take steps to ensure Reserve follows through on these reclamation obligations.

Furthermore, Reserve's request to retain Policy I-203 in the 2016 KCCP should be rejected and the property returned to a Forest zoning in accordance with County codes; and the mining site conversion demonstration project provision should be dropped from the KCCP as recommended by the KC Executive. Not only is the Reserve site unsuitable for residential development, but Reserve Silica has had ample time to submit a proposal – and still has the opportunity to do so – yet has failed to take action despite making comments for more than a year now that submission was imminent. And given the numerous long-term health and environmental concerns associated with this property that are yet to be fully assessed and resolved, any extension of the I-203 policy would only serve to create a state of limbo during which it is likely little more will be done to complete reclamation and restoration of the property to its pre-mining state.

Additional background, with full references, on the key points above can be found in the detailed analyses accompanying this summary.

1.2 Questions and Short Answers

Reserve's proposal for a mining site conversion Demonstration Project raises a number of questions, most of which are poorly addressed, if at all, in Reserve's material. Each of these questions are discussed in detail in the body of this report, along with the background for the answers presented here. The following is a brief synopsis of the question, and the short answer. For more specifics, please refer to the section of this report noted for each question.

Is reclamation of the property for forestry "impractical" as Reserve claims? (Sections 2.1-2.4)

No. Estimated costs for reclaiming 70% of the property to where it can support commercial forestry is ~$70,000. And the likely net income available to Reserve to help fund this cost, from harvest of existing Douglas-fir plantation on the property is ~$400,000.

Hasn't the property always been primarily a mining site? (Section 2.5)

No. The vast majority of the property has been managed for forestry from the 1890s until the mid-1980s. While mining has occurred on the property for 65 years, it has only involved a small portion of the property, <10% until the 1970s, and topping out at 35% of the property at the close of mining in 2007.

Is the proposal compatible with surrounding land uses and supported by adjacent property owners? (Section 2.6)

No. The property is totally surrounded by designated Natural Area and Open Space lands, and Forest Production District lands; none of which will ever support houses. As such, the proposed "rural community" is incompatible with surrounding land uses. The only adjacent property owner who Reserve claims to support the current 72-unit development is Baja Properties, whose ownership encompasses just 13% of Reserve's perimeter.

Doesn't reclamation for forestry conflict with the 2012 IFC and UW study conclusions? (Section 2.7)

No. The key conclusion from the IFC study was that an industrial timberlands owner would likely not be interested in purchasing this property in whole to reclaim it for forest production. The UW study agreed. Now that filling the huge mine pits is nearing completion, the incremental costs to finish reclaiming the site for commercial forestry is pretty minimal. While an industrial timberlands owner would likely still not be interested, there are viable forestland buyers for the property if sold in 80+ acre blocks.

Does this property meet GMA and King County criteria for "forestland of long-term commercial significance"? (Section 2.8)

Yes. The UW study concluded in 2012 that the property would likely not meet criteria for "forestland of long-term commercial significance". With the reclamation now proposed by Reserve, and with the changes in ownership of surrounding properties since 2012, this property would fully satisfy both GMA and King County definitions.

Why is Reserve promoting conversion to Rural Residential development? (Section 2.9)

While Reserve is claiming their upzone request is because of "impractical investment" required to reclaim the site for forestry, we've demonstrated that these costs are minimal. What's likely driving the upzone request is the potential to capture a windfall by being able to sell residential lots, which we estimate would be worth an additional $1,700,000 to Reserve - above the value of reclaiming the site for forestry.

Who would buy these lands if the upzone was denied and the property was reclaimed for forestry? (Section 2.10)

While a single industrial timberlands owner is unlikely to be interested in this property, even after forestry reclamation, there is a very viable market for this forestland property if sold in 80+ acre blocks.

What is cement kiln dust (CKD), and why is it an issue on this property? (Sections 3.2-3.3)

CKD is a highly toxic waste product from the production of cement. 350,000 tons of CKD was dumped in unlined pits on the property in the 1980s. Though the pits have been capped, the CKD has contaminated the soil, surface and groundwater on the site with extremely caustic leachate and heavy metals, especially arsenic and lead. While efforts to control the contamination have been ongoing for fourteen years now, the contamination continues, and has now migrated off-site, and may pose a threat to public waters of the State in the near future.

Has the site been adequately evaluated for toxins and other human or environmental risks? (Section 3.4)

No. While Dept. of Ecology is monitoring the CKD pits and the contaminated remediation area for pH, arsenic, lead, and magnesium, there are other highly carcinogenic toxins commonly associated with CKD (dioxins, furans) that have not been tested for. In addition, there is substantial evidence for numerous other sources of contamination from almost 50 years of undocumented dumping on this site; for which no testing has been done.

Besides CKD, what other contaminants and risks might be expected on the property? (Sections 3.5-3.6)

There are indications the following contaminants may well exist on this site: ASARCO slag road ballast and gravel, petroleum-based contaminants, asbestos, carcinogenic polycyclic aromatic hydrocarbons (cPAHs) and heavy metals associated with coal tailings, hazardous waste "fertilizers" and "liming agents." Portions of the site are also identified as Coal Mine Hazard, from the coal mine tunnels and workings from the 1920s – 1940s.

What are the environmental risks and human health hazards on the site? (Section 3.7)

DOE classified this site as a Class 1 (highest priority) MTCA toxic cleanup site in January 2016, based on the uncontrolled CKD contamination. Their evaluation rated the Human Health Risk at 4.4 on a 1-5 scale, where 5 is extreme risk to human health. Arsenic levels in surface waters are

up to 30X MTCA cleanup levels. Human or animal contact with contaminated soil or surface water can cause severe burns. DOE also views that the additional groundwater from 72 houses served by off-site public water and on-site septic systems could exacerbate the ongoing problems with trying to control the CKD contamination and migration.

Does this proposal meet the requirements for a mining site conversion Demonstration Project under I-203? (Section 4.1)

No. I-203 specifies five criteria a project must meet to qualify as a mining site conversion Demonstration Project. The current proposal does not fulfill any of these five criteria.

Is this proposal consistent with King County policy and goals? (Section 4.2)

No. This proposal violates at least 20 separate, long-standing County Policies, as well as the Greater Maple Valley/Cedar River CSA sub-plan.

Would approval of this proposal set a precedent for other landowners to follow suit? (Section 4.3)

Undoubtedly. Seven other known mining sites would likely apply for upzone if Reserve's proposal is approved. Plus, there are numerous nonconforming FPD parcel owners in the area who would also likely petition for upzone under this precedent. This could represent a major detriment to preserving King County's precious Natural Resource lands.

What other major issues are associated with this proposal? (Sections 5.1-5.4)

The structure of this proposal would shift responsibility and liability from Reserve to a future Homeowners Association and to King County, while retaining Reserve's ability to extract additional value from the property. The proposal puts the management responsibility (and funding?) for the CKD Hazardous Waste administration and for the forest reclamation on the HOA, which is entirely inappropriate. The recreational opportunities Reserve touts in this proposal, if enacted, would accrue only to the residents, as the public will be provided no right of access to the property. Finally, there is extensive opposition within the community to this proposal, to Rural-to-Rural TDR transfers, and to Demonstration Projects in general.

Just who is Reserve Silica, and what is their background? (Sections 6.1-6.5)

Reserve Silica is a wholly owned subsidiary of Reserve Industries, headquartered in Albuquerque, NM. Reserve Industries started in the uranium business 60 years ago, and grew to be a multi-national corporation with global interests in mineral exploration, extraction and processing. The three Melfi brothers assumed control of the company when their father retired in 1985. The brothers redirected the company more into industrial waste processing with the formation of another wholly-owned subsidiary, L-Bar Products, and purchase of the assets of Industrial Mineral Products, including a magnesium recovery facility in Chewelah WA and the Ravensdale silica sand mining lease. L-Bar Products was cited for numerous hazardous waste violations in Chewelah by WA DOE and the US EPA, including criminal charges by EPA. The Ravensdale mining lease was transferred over to the newly formed Reserve Silica subsidiary in 1990/91, prior to Reserve's closing down the Chewelah plant and filing for L-Bar bankruptcy in

1992. Reserve Silica operated the silica sand mining operation until its closure in 2007, and the pit filling dumping operation at Ravensdale since its inception. Reserve Silica has had numerous WA DOE violations and fines through much of its tenure. WA DOE classified the site as a Class 1 (highest priority) toxic cleanup site in January 2016. The Melfi brothers continue to be the principles in Reserve Industries, Reserve Silica and other subsidiaries.

Should Policy I-203 be extended in the 2016 KCCP to allow Reserve to submit their current proposal? (Section 5.5)

No. We believe Reserve has already had ample opportunity to submit a Demonstration Project proposal. It has been nearly four years since the mining site conversion demonstration project amendment to Policy I-203 was adopted to accommodate Reserve's request; they purchased their alternative TDR sending site for the project more than two years ago; they indicated they were within 2 weeks of submitting their proposal over a year ago; and their full, 273-page proposal document was dated May 1, 2016 – 3 ½ months ago. And yet no proposal has been submitted to date. There is still a four month window to submit a proposal before the 2016 KCCP is adopted. However, given the numerous issues with the current proposal as described within this document and the health and environmental risks associated with the property, this site is not suitable for residential development and no amount of additional time is going to change that. As such, Policy I-203 should be dropped from the KCCP so that reclamation work can be completed and the site returned to a Forest zoning and substantially restored to its pre-mining state.

What is FRCV's recommendation regarding Reserve's current proposal? (Section 1.1)

This site is NOT suitable for residential development, and there are no major barriers to reclaiming the majority of the site to where it can support viable forest uses for the long-term. To approve a residential use for this site would expose King County to substantial risk of future litigation from property residents and others. The Council should reject Reserve Silica's Demonstration Project proposal, revert the designated Land Use of the property to Forest and the zoning to Forestry and retain the property within the FPD; work with Reserve to develop a final reclamation plan that will reestablish viable forests on the majority of this property; and take steps to ensure Reserve follows through on these reclamation obligations.

2.0 IS RECLAMATION FOR FORESTRY "IMPRACTICAL"?

2.1 Executive Summary: Forest Reclamation

King County Code clearly indicates the Reserve Silica site should revert to a Forestry zoning upon completion of reclamation work, as it was zoned prior to being designated as Mining lands. The crux of Reserve's argument to upzone the property to Rural Residential is that the property is unsuitable for long-term forestry use without "significant and impractical investment." No information or data was provided to support this assertion throughout the extensive 2012 KC Comp Plan deliberations. However, Reserve Silica's May 1, 2016 proposal now suggests that 282 acres, or 75% of the property is suitable for long-term forestry use, with 71 of these acres to be used for a 72-house "rural community" and 211 acres put into a "Managed Forest." If the 55-acre wetland complex, which requires no reclamation and provides substantial secondary forestry benefits, is included, then 337 acres, or 89% of the property is apparently suitable for forests. However, analysis of the three studies* commissioned by Reserve Silica would suggest that 337 acres is probably an unrealistically optimistic figure. Rather, a more realistic estimate is that 265 acres, or 70% of the property is likely suitable for long-term forestry use.

Appendix I of the May 1, 2016 Reserve Silica proposal lays out AFM's recommended plan for reclaiming these lands for forestry. Using this plan, along with data from the 2012 IFC and UW studies, it is possible to derive a reasonable estimate of the costs to perform this forest reclamation, and thus test the validity of Reserve's pivotal assertion of "significant and impractical investment" being required to reclaim the bulk of the property for forestry.

Assessment of the cost to reclaim 265 acres of the property for forestry, given AFM reclamation recommendations, is something on the order of $70,000 – "significant" yes, but hardly "impractical." Using data from Reserve Silica's operation and from Erickson Logging's mine pit filling activity on the adjacent property to the east, this ~$70,000 "investment" likely represents only about two weeks' worth of average net profit from the filling activity Reserve has been doing for the past nine years. Furthermore, all three of the Reserve-commissioned studies agree that the 73 acres of well-stocked, 37-year old Douglas-fir plantations in the NE quadrant and SW corner of the property are suitable for commercial forestry as-is. These lands were planted by Burlington Northern Timberlands (Plum Creek predecessor) in the early 1980s, along with most all the other lands on and surrounding Reserve's current ownership. Erickson Logging has been very successfully logging precisely the same type timber on the adjacent lands to the east and south since 2007. Given Erickson's harvest yield experience, and a conservative estimate of delivered log prices from the Washington Department of Natural Resources, logging these 73 acres should yield something on the order of $400,000 net - after logging, hauling and replanting costs. This profit alone would cover the required forestry reclamation costs estimated for the 265 acres of Reserve's property five times over! This seems to be pretty compelling evidence to refute Reserve's assertion of an "impractical" cost to reclaim the majority of this property for Forestry.

If the forestry reclamation plan recommended by AFM and included in Reserve Silica's Demonstration Project proposal were to be implemented on the suitable 265 acres, this property would fully satisfy King County's criteria for defining "forest land of long-term commercial significance."

The likely driving force behind Reserve's aggressive lobbying for the proposed Demonstration Project and an upzone to their property is NOT to avoid a "*significant and impractical investment*" to reclaim the property for long-term forestry, as purported, but rather the desire to capture the windfall profit from selling residential lots, while also stripping off most of the remaining timber value on the property through the necessary land clearing for the housing development, and thinning of the remaining mature conifer plantation. The estimated benefit to Reserve Silica of selling residential lots were they to be granted an upzone and approval to install a 72-unit housing development on the property would be something on the order of $1,700,000 – net!

Based on this analysis, Reserve's Demonstration Project proposal should be flatly rejected. Further, a plan for reclaiming the majority of the property for forestry should be formulated and adopted, and steps taken to ensure Reserve Silica and its parent company, Reserve Industries, are held responsible and accountable for this work. The costs of this reclamation work are not an "investment" cost, but rather a business cost associated with the value Reserve received from operating, and degrading, the site through their mining and fill site activities over the last 30 years.

*International Forestry Consultants (IFC), Feb 13, 2012; University of Washington (UW), Mar 12, 2012; and American Forest Management (AFM), May 9, 2016.

2.2 What is the Magnitude of the Likely Forest Reclamation Costs?

The crux of Reserve's argument to upzone their Ravensdale property to Rural Residential is that the property is unsuitable for long-term forestry without "*significant and impractical investment.*" And if the site is thus impractical to use for long-term forestry, then their conclusion is that it makes no sense to return the property to a Forest zoning; but rather, its highest beneficial use becomes, instead, rural residential, with an accompanying Rural Residential zoning.

This argument is based on assertions that are not supported by data, evidence or experience. First, Reserve claims that the property is not suitable for long-term forestry without "*significant and impractical investment to create productive forest soils.*"[1] But both forestry studies commissioned by Reserve in 2012[2,3] to assess the forestry potential of this property concluded that with the exception of the 50 acres of mine pits currently being filled, the soil site quality on lands suitable for forest on this property are "*average for Douglas-fir production.*"[4,5] And the fact that Reserve's current proposal calls for the establishment of a "*211 acres managed long-term commercial forest*" is pretty compelling evidence against their assertion of 'impractical' investment required to reclaim the majority of the property to where it can support viable forests. In fact, this proposed 211-acre managed forest implies that 89% of the property (i.e., the 'managed forest' + the 71 acres proposed for development + the 55-acre wetland complex) are suitable for long-term forestry purposes.

When the 'impractical investment' argument was first submitted in February 2012,[6] the King County Executive and his staff (including forestry staff within DNRP) strongly disagreed with this conclusion, stating:

> "*Restoring the open mine area to forest is possible and should be required" . . ."it is reasonable to expect that it* [the mined area] *will be reclaimed and replanted to forest.*" "*Other active and past mines in the vicinity* [Grouse Ridge; adjacent Wagner/Erickson property] *are expected to be restored to productive forest.*" "*What they* [Reserve Silica] *consider a forest investment should be properly classified as a mining reclamation investment.*" "*On the Reserve Silica site, we expect that managed commercial forest will offer greater environmental benefit than building on the most productive areas and leaving the rest unmanaged."* [7]

These sentiments were reinforced by the King County Rural Forest Commission, which also disagreed with Reserve Silica's critical conclusion and identified the lack of supporting data behind this, stating:

> *"Both reports* [International Forestry Consultants and UW Gordon Bradley reports to the Reserve Silica owners] *appear to assume that restoration of the affected forest land would be too expensive as a forest investment,* ***without providing analyses of potential restoration methods and alternatives along with related economic analyses and cost estimates****.* [emphasis added] *From our perspective, the cost of reclamation should be viewed as a cost of mining. Since these lands were originally mostly timbered, it is reasonable to assume that mining activities were the main cause of soil productivity decline. The mining operation, not the future owners of the property, should bear the responsibility and costs for restoring site and soil productivity to pre-mining values*." [8]

With the newest information provided in Reserve Silica's May 1, 2016 proposal, a recommended forestry reclamation plan has now been proposed by Reserve's consultant, American Forest Management (AFM).[9] By utilizing these reclamation assumptions, in conjunction with data from the 2012 IFC and UW studies, we are now able to dimension the magnitude of the financial costs required to reclaim the majority of the property for forestry use, and thus test the validity of Reserve's 'impractical investment' assertion

2.3 Assessment of Reclamation Costs

2.3a Areas Suitable For Reclamation To Forestry

The area AFM is recommending for "Managed Forest" (see Figure 1. AFM Management Units) includes 8 acres of Type 1 land, 34 acres of Type 2, 23 acres of Type 3, 50 acres of Type 4, 8 acres of Type 5, 6 acres of Type 6, 30 acres of Type 7, and 52 acres of Type 8; totaling 211 acres. In addition, the two development areas would clearly be suitable for forestry if not converted to a rural residential development. The North residential area is 33 acres, of Type 2 conditions; while the South residential area is 38 acres of Type 7 conditions. (This total of 71 acres includes 54 acres cleared for residential lots plus 17 acres of open space buffer strips between the housing clusters.) So the total land suitable for forestry under AFM's proposal is 282 acres (211+33+38), or 75% of the property. And an additional 55 acres are a Class 1 (KCC 21A.06.1415) wetland complex with buffers, on the southern portion of the property. While AFM does not propose this wetland complex to be managed for forestry, this area provides extensive secondary forest benefits, and should clearly be included as a viable part of any managed forest property. Including these 55 acres would imply a total of 337 acres, or 89% of the property, would qualify as forestlands under AFM's proposal. This fact alone tends to dispute Reserve's key conclusion that the majority of the property is not suitable for forestry without impractical investment.

King County Class 1 wetland on southern portion of Reserve Silica property. (M.A. Brathovde, July 2016.)

In reviewing this proposal, we believe the AFM view is overly aggressive, and represents a "most optimistic" view of how much of the site could potentially be suitable for forestry. Under the AFM proposal, only 40 acres outside of the two residential development areas and the wetland complex would be excluded from forest management - the capped toxic waste dump sites, the BPA powerline easement and a portion of the Type 1 steep slope coal tailings.

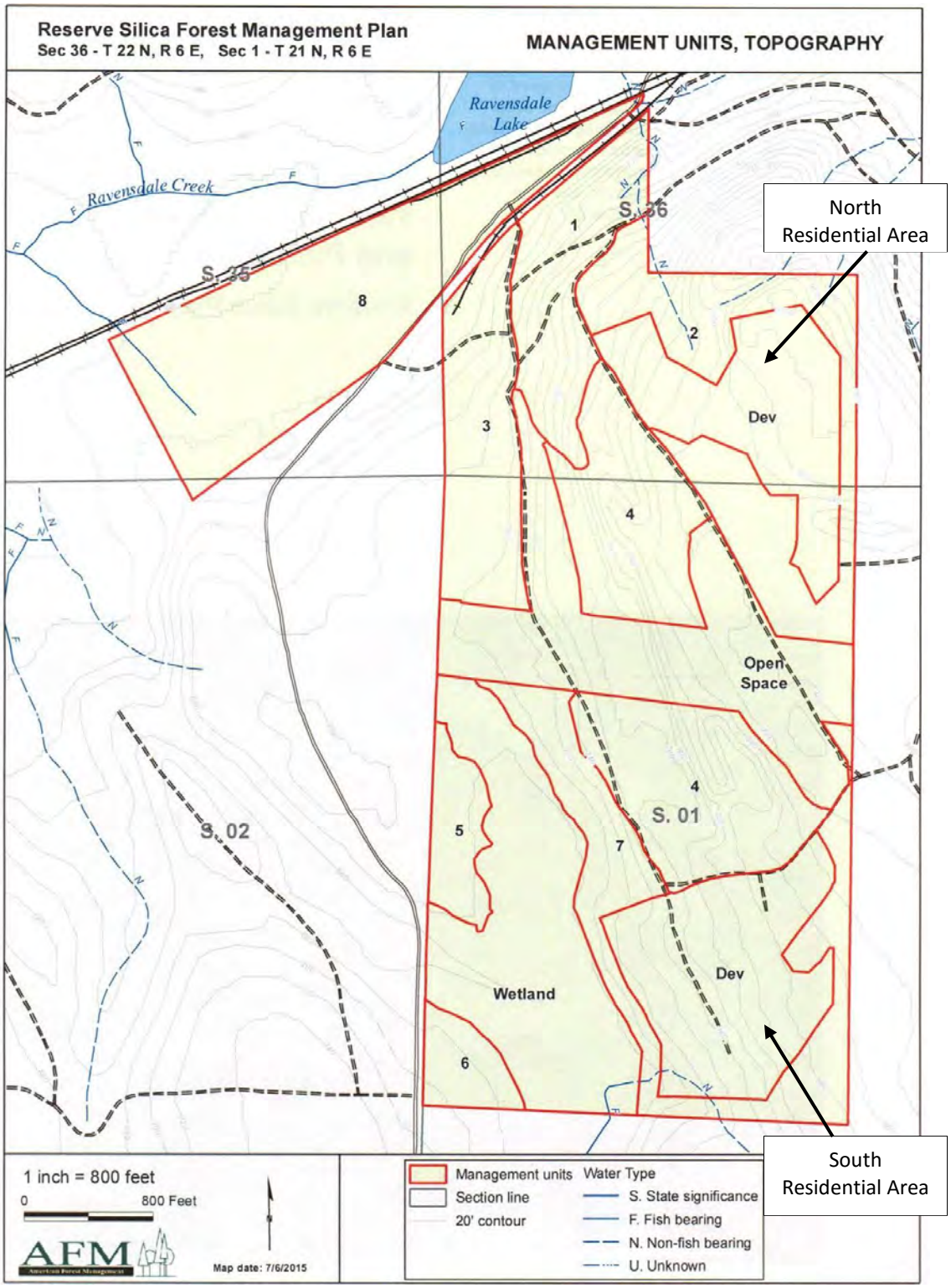
We agree with IFC and UW 2012 conclusions that the 52 acre plant site and clay ponds (AFM's Type 8) could NOT be effectively reclaimed for forestry. The clay ponds that dominate this site are reportedly 25' deep, and would require extensive decompacting, dewatering and soil amendments, and even then, any ability to operate harvesting equipment on the site would be highly doubtful.[1] We would suggest this area be reclaimed as open space lands, rather than forestry. We also agree with IFC and UW that all but 3 acres of AFM's Type 3 (totaling 23 acres) cannot confidently be managed for forestry, as these 20 acres are part of the Holcim Remediation Area, and contain monitoring wells and other structures intended to control (as yet unsuccessfully) the highly toxic leachate and runoff from the hazardous waste dump sites on the property. There is an easement on this portion of the property (and the capped dump sites) that gives complete control of the surface, subsurface and groundwater of this 20 acres to Holcim, for their mandated environmental obligations. As such, the County, Reserve and Holcim should coordinate to develop a mutually agreeable reclamation plan for this area, but it is highly unlikely that such a reclamation plan would include forestry.

June 2010 aerial photo of three main clay settling ponds and plant site (to right) adjacent to BNSF railroad and Ravensdale Creek and Ravensdale Lake. (Image: Google Earth Pro.)

After adjustment for these deletions, the area suitable for forestry (including the wetland complex) would total about 265 acres, or 70% of the property. [211 Managed Forest recommended by AFM + 71 Development & Buffer Areas + 55 Wetland Complex - 52 Plant Site/Clay Ponds - 20 Holcim Mitigation Area].

The IFC data shows that of these 265 acres, only the 50 acres of recently filled mine pits (Type 4) and the Wetlands complex, have a DNR Site Class of less than III (average forestland site), or a Land Grade of less than 3. Both IFC and UW agree that the soil site quality on these largely undisturbed lands is "average for Douglas-fir production."[2] This indicates that the underlying soils on these lands have not been substantially degraded as a result of the years of mining activity on the property. The 55-acre Wetland Complex is intact, has not been significantly impacted by any mining activity, and requires no reclamation work.

Figure 1. AFM Management Units.



2.3b Forest Reclamation Assumptions

The table below is a summary of the acres considered by this analysis as suitable for forestry use after reclamation. The acreage is identified according to AFM's "Type" classes, the current timber conditions on that Type (drawn from IFC, UW and AFM studies), and the assumed Reclamation Plan (derived from the AFM recommendations). Note that the 2012 IFC and UW studies, in some cases, used a different "Stand" numbering system from the AFM "Types." In these cases, the IFC/UW Stand number that corresponds to each AFM Type is also shown.

AFM Type	Acres	Current Conditions	IFC/UW Stand	Reclamation Plan
1	8	Age 24 hardwoods	3	Harvest now at break-even; apply herbicides; plant Douglas-fir
2 + Dev N	67	Age 37 well-stocked, Douglas-fir plantation	2	Harvest now, replant to Douglas-fir
3	3	Age 40 hardwoods; poor form	4	Harvest now at break-even; apply herbicides; plant Douglas-fir
4	50	Filled mine pits	6	Short rotation of alder, then slash; second rotation of alder; then plant Douglas-fir
5	8	Age 27 mostly hardwoods	8	Precommercial thin, favoring conifer & alder; let grow for 15 years, commercial clearcut, apply herbicides and replant to Douglas-fir
6	6	Age 37 well-stocked, Douglas-fir plantation	9	Harvest now, replant to Douglas-fir
7 + Dev S	68	Age 34 mostly hardwoods	7	Precommercial thin, favoring conifer & alder; let grow for 15 years then commercial clearcut, apply herbicides, plant Douglas-fir
Wet	55	Wetland complex	Wet	No reclamation required
TOTAL	**265**			

Reclamation Cost for AFM Types 1 & 3 (11 acres)

For these two small near-mature hardwood types, AFM calls for a commercial harvest now, then treating the unit with a specialty herbicide such as Forestry Garlon XRT to control woody plants and weeds, then replanting to conifers. It would be fair to assume the logging operation would not be much more than break-even, with delivered log values just offsetting logging and transportation costs. Treatment with Forestry Garlon XRT might run $110/acre,[1] while IFC would indicate planting costs would run about $250/acre. So the total cost for reclaiming these 11 acres for forestry might run ~$3,960 [($110+250)*11 acres].

Harvest of mature/near-mature hardwood stands of AFM Types 5 & 7 (76 acres)

Type 7, including the South Development area, at 68 acres, dominates these mature hardwood Types. AFM calls for commercially thinning this 34 year old stand now, removing some of the lower-valued hardwoods and leaving the minor conifer component and some of the hardwoods. IFC calls for holding this stand for another 15 years, then commercially clearcutting it, treating it with herbicides to control the weed and

Type 7 hardwood stand on southern portion of Reserve Silica property. (M.A. Brathovde, July 2016.)

woody competition, and replanting to Douglas-fir. We will assume a break-even commercial thinning now, then a commercial clearcut harvest in year 15, generating net income sufficient to cover an herbicide application and replant to Douglas-fir.

Type 7 hardwood stand. (M.A. Brathovde, July 2016.)

Type 5 is an 8-acre stand of predominately near-mature hardwoods (~age 27). AFM calls for holding this stand for 10 – 20 years, then clearcutting it. UW suggests a precommercial thinning now, favoring leaving the Douglas-fir, alder and western red cedar in the stand – very similar to AFM's recommendation for the slightly older (age 34) Type 7, except the thinning would not be expected to break even financially. We will assume a precommercial thin now (assume $150/acre net cost); followed by clearcutting in 15 years (stand age 42) generating sufficient net income to cover an herbicide application and replanting to Douglas-fir. So the net cost for reclaiming these 76 acres for forestry might run ~$1,200 ($150*8 acres].

Forestry Reclamation Cost Estimate AFM Type 4 - Filled Mine Pits (50 acres)

The 50 acres of recent mine pits are currently being filled under an Interim Reclamation Plan, which will restore the rough grades of this area to their pre-mining contours with clean fill and approved inert material. These filled areas will then be capped with a ~2' lift of topsoil and hydroseeded.[2] This work is progressing now, and Reserve anticipates completing this effort by the end of 2016. This work needs to be done regardless of whether the property is returned to Forestry use or upzoned for Rural Residential. As such, the costs for this activity should NOT be included in the "forestry reclamation" accounting, and thus should not be contributing to Reserve's assertion of "significant and impractical investment" to reclaim the land for long-term forestry.

Backfilling operations at the Ravensdale site. (reservesilica.com)

In reality, in all likelihood, this pit-filling activity is a significant net revenue generator for Reserve Silica. Their posted dumping fees are currently $125 - $150 per truck.[3] Frank Melfi reports that truck traffic into the Reserve Site has varied from a low of 20 trucks per day, to a high of 400 trucks per day.[4] The Traffic Impact Report by Transpo Group dated June 17, 2015[5] shows an average of 108 trucks per day over the 7-week period April 27, 2015 – June 12, 2015. This is the rate used to assess the likely net traffic impact of Reserve's Development proposal, so should represent a reasonable average of pit filling activity. Based on these numbers, the apparent revenue generated from the pit filling activity should be running somewhere in the $13,500 - $16,200 range per

day on average. While we don't know Reserve's costs for this pit filling activity, and thus cannot compute a net income from pit filling, Kurt Erickson's trench-filling operator who manages the comparable activity on the property immediately east of Reserve, reports that their net profit for filling activity runs between $100 and $200 per truck.[6] And the Site Development Specialist for the County's Department of Permitting and Environmental Review, who oversees the Reserve pit filling activity, has made the comment that he would "much rather have a permitted fill site than a gold mine," referring to the financial profitability of fill sites like Reserve's and Erickson's.[7] Given this anecdotal evidence, it's probably fair to guess that Reserve's net profit for the pit filling is perhaps $75/truck, or about $8,000 per day on average. As for the topsoil capping requirement, Erickson is currently capping ~12 acres of filled mine trenches on his property, using topsoil trucked in as part of his ongoing filling activity.[8] In Reserve's case, the Interim Reclamation Plan[9] shows two "Topsoil Storage Areas" for use in capping the three remaining mine pits. Typically what would occur is that the native topsoil would be scraped off and stockpiled before a mine pit is opened. Then on completion of the mining and filling of the pit with off-site fill, the native soil would be spread back over the graded pit. Whether this is the case with Reserve, or whether the "Topsoil Storage Areas" are of imported topsoil, is unknown. In any event, the topsoil capping activity is included as part of Reserve's Interim Reclamation Plan, and is required regardless of future use of the site. As such, topsoil capping costs should not be attributed to forestry reclamation.

Once the mine pits are filled, graded and capped with topsoil, AFM calls for planting the newly reclaimed land with red alder to help colonize this site, and to help restore the soil productivity. IFC and UW studies also support this proposal. IFC anticipates significant risk of rodent/deer damage to this first crop of trees, so calls for steps to protect the seedlings (e.g., additional seedlings planted, mesh sleeves), which will effectively double the normal planting costs. While AFM does not mention this, we agree with IFC that seedling protection steps be specified as part of the forestry reclamation on these pits. IFC estimates a planting plus seedling protection cost of $500/acre. The AFM plan indicates that the first rotation of alder will likely start to decline in vigor after about 5 to 10 years. As such, they call for regular monitoring of the stand from age 6 to age 15, and doing a commercial harvest or a precommercial slashing, depending on the size of the timber, when vigor starts dropping off significantly. For estimating purposes, we will assume the stand liquidation occurs at age 10, and is a precommercial slashing (scarification), costing $25/acre. Note that IFC suggests periodic application of biosolids could help rebuild the soil through this first rotation, but AFM does not call for that in their reclamation proposal. The County is currently running trials on the application of biosolids on Reserve's mined property.[10] Following liquidation of the first crop of alder, a second rotation of alder would then be planted, though the need for extra seedling protection should be reduced or eliminated. IFC planting cost of $250/acre will be assumed. This second rotation of alder should retain vigor for a longer period of time. While AFM does not call for any thinning of this commercial second crop of alder, IFC did call for a precommercial thinning, at $110/acre. We think it makes sense to allow for this thinning on the second rotation, and assume it would occur when the stand is about 15 years old (or 25 years from now). On this second rotation, we also assume the monitoring could occur every other year, rather than annually as in the first rotation. We are also assuming that the point of significant vigor decline in this second rotation would occur at about stand age 25. At that point, it would be fair to assume that this

second crop could be commercially harvested, generating net revenues in excess of costs required for planting a third rotation of Douglas-fir.

So a reasonable estimate of reclamation costs for forestry on the 50 acres of recently filled mine pits is as follows:

Year	Activity	Cost/Acre
1	Plant alder seedlings and install protective sleeves	$500
6-10	Annual monitoring	$4/yr
10	Precommercial slashing/scarification of unit	$25
10	Plant second rotation of alder	$250
16-25	Biennial monitoring ($4/ac every other year)	$2/yr
25	Precommercial thinning of alder	$110
35	Commercial harvest of alder, use logging proceeds to replant to Douglas-fir	$0
	Cumulative Cost/Acre	$925
	Total Cumulative Cost to reclaim 50 acres for commercial forestry	**$46,250**

Harvest of mature Douglas-fir plantations of AFM Types 2 & 6 (73 acres)

These two Types are 37 year-old, well-stocked Douglas-fir plantations growing on Site Class III (and II). This is precisely the same timber types that Erickson Logging as been harvesting on the adjacent property to the east and south since 2007. Both of these properties (Reserve and Erickson) were previously owned by Burlington Northern Timberlands, which became Plum Creek Timber Company in 1989. BN Timberlands logged the second growth timber on these lands in the late 1970s/early 1980s, replanting them to Douglas-fir at approximately 435 stems per acre. On the most recent 628 acres of harvest, Erickson Logging predicted log deliveries to average 13.3 mbf/acre (thousand board feet/acre), removing an average of 94% of the standing merchantable volume.[11] It would seem reasonable to assume the stocking level in Types 2 and 6 on Reserve Silica's property are similar. The Washington Department of Natural Resources (DNR) reports an average delivered log price for coastal Douglas-fir 3SM logs in April 2016 to be $549/mbf; and *Forest Stewardship Notes, Lumber, Log and Stumpage Prices in Washington State* indicates an average logging cost of $110/mbf. So a reasonable estimate of the net stumpage value of the merchantable Douglas-fir on Reserve's 73 acres of Type 2 & 6 (including the North Development Area) is $426,225 (73 acres * 13.3 mbf/acre * ($549-$110)). Using IFC's cost estimate of $250/acre to replant the unit to Douglas-fir implies a planting cost for the 73 acres of $18,250. With these assumptions, Reserve

Type 2 Douglas-fir timber stand on northeast quadrant of Reserve Silica property. (M.A. Brathovde, July 2016.)

Type 2 Douglas-fir timber stand. (M.A. Brathovde, July 2016.)

might expect to realize a net profit of $407,975 from harvesting these two units and replanting them to Douglas-fir.

2.4 Estimate of Total Forestry Reclamation Cost

The forestry reclamation assumptions above are generally based on AFM's recommended treatments, except we are including the northern Development Area with Type 2, and the southern Development Area with Type 7; and in the case of Type 2, we are clearcutting the entire unit, rather than just thinning outside of the clearcut development areas as proposed by Reserve. (Reserve is suggesting thinning between the housing clusters to generate a more open forest, which would be more visually appealing for the Development's residents.) We have supplemented AFM's recommendations with recommendations from IFC and from UW, and attempted to price out recommended reclamation activities for each Type, using IFC cost data wherever possible, and supplementing the cost information with internet research as needed.

In aggregate, across the 265 acres we would recommend reclaiming for forestry, the total cost, given the assumptions described above, are estimated to run on the order of $70,000; while the net revenue from clearcut harvesting the 73 acres of Type 2 & 6 (the 37-year old Douglas-fir plantations), including the Development Areas, is expected to run approximately $400,000.

The purpose of the analysis above is not to predict specific costs or revenues, nor to fine-tune reclamation treatment regimes. Instead, the analysis is aimed at trying to affirm, or reject, Reserve's pivotal assertion that the property is unsuitable for long-term forestry without "significant and impractical investment." While the reclamation and cost assumptions underpinning this analysis should be vetted and refined, the bottom-line conclusion is obvious and robust – ***the costs to "reclaim" ~70% of the property to where it can support viable forest uses is NOT particularly "significant," and certainly not "impractical," as asserted by Reserve***. The estimated $70,000 total cost probably represents about two weeks profit from Reserve's pit filling activity, which has been ongoing since 2007.[1] And just clearcut harvesting the 73 acres of existing 37 year-old, well-stocked Douglas-fir plantations in the northeast and southwest corners of the property, which were planted by Burlington Northern Timberlands and somehow managed to avoid being degraded through decades of mining activity on other parts of the property – and which are the exact same type of timber Erickson Logging has been harvesting for the past 9 years on the adjacent property to the east and south – is expected to cover ALL of the projected Forestry Reclamation costs 5X or 6X over!

2.5 Hasn't This Property Always Been Primarily a Mining Site?

Reserve asserts that the property has "*been used for or supported mining since the turn of the last century* [i.e. 1900]," and implies that mining uses have dominated the property use ever since.[1] Available data indicates coal mining activity on this property started 1924.[2] Until the mid-1940s mining occupied ~ 4% of property.[3] By the end of the coal mining days, in 1947, mining occupied ~7% of surface of this property.[4] Reserve confirms that there was no mining on the property from 1948-1966. Silica mining started in 1967, growing to occupy 34% of surface by conclusion of mining activity in 2007.[5] Up until Reserve's purchase of the property in 1997, the mining activity was through leases of portions of

the property from the Northern Pacific/Burlington Northern/Plum Creek owners. The NP/BN/PC owners continued to manage the non-mined portions of the property as part of their ~8,400 acre timberlands block into 1980s.[6,7,8] So while mining has been active on this site for 65 years, it has tended to occur on a relatively small portion of the property.

1965 aerial photo showing Reserve Silica property and surrounding lands heavily timbered. Old strip mines are largely revegetated. (King County Road Services Map Vault.)

On the forestry side, evidence indicates the old growth timber on the property was likely logged in the 1890s.[9] Aerial photography indicates the natural second-growth was logged from much of the property in the mid-1930s.[10] Aerial photography again shows that the majority of the property was logged by BN/Plum Creek in 1980/1981, and replanted, with some evidence of subsequent thinning.[11] With the exception of the plant site/clay settling ponds, the whole property was zoned Forestry and included within the FPD until the mid-1990s.[12,13,14] Reserve has done no forest management activity since their purchase of the property in 1997.[15]

The evidence strongly disputes Reserve's assertion that this property has been used mostly for mining since the turn of the last century. In fact, the majority of the property has been actively managed for forestry well into the 1980s.

2.6 Is Proposal Compatible with Surrounding Land Uses and Supported by Adjacent Property Owners?

Reserve claims "*All property owners adjacent to the mining site wrote letters of support for the RS proposal explaining that they each considered the proposed site plan submitted by RS would be compatible with surrounding uses.*"[1] Note that in response to our objections expressed after Reserve's original submission in April 2016, they have footnoted this statement in their May 1 proposal, indicating that "*After submittal, the two small properties west of the mining site were sold. One of the new owners confirmed support for the RA-10 proposal. One did not.*"

It is worthwhile to note that the letters of support they refer to were form letters signed, at Reserve's request, in Jan/Feb 2012 by the three adjacent (non-County) owners, and the 'proposed site plan' presented to these owners at the time was a 32-unit development[2,3] – substantially different from the current 72-unit proposal. And to correct their May 1 footnote, one of the two parcels was actually sold prior to Reserve's 2012 submittal, and thus the signer of this letter wasn't even an owner at the time he signed the letter. The signer of the second letter formally retracted his letter of support prior to Reserve's submittal. He sold his property shortly afterward, and the new buyer, Chris Powell (P&D

Logging), submitted a letter specifically objecting to Reserve's upzone.[4] He has also recently re-confirmed his continued opposition to Reserve's proposal.[5]

52% of lands on the perimeter of Reserve's property are owned by Wagner/Erickson, 23% by the County, 12% by Chris Powell, and 13% by Baja Properties. Wagner's support was based on the 32-unit proposal, and has not been reconfirmed for the current 72-unit proposal. The County's ownership is all in designated Natural Area and Open Space lands that allow no residential development of any kind. They have not been consulted in terms of whether Reserve's 72-unit 'rural community' would be compatible with these Natural Area/Open Space lands or not. It is our opinion that having a 72-unit rural community, in the middle of a 3,500-acre block of protected lands[6] where NO houses will be constructed, is NOT compatible with these Natural Area/Open Space lands. Powell sent a strongly worded letter to Paul Reitenbach, Comp Plan Manager in 2012,[7] clearly indicating that he did NOT support the proposed upzone and residential development. He has indicated that such a development (40-units at that point) could seriously impede the operation of his forestry-related business that he operates, under a forest management plan approved and monitored by the County. Reserve's latest footnote[8] indicates that the Baja Properties owner has confirmed his support for Reserve's current proposal. We have not attempted to confirm Reserve's footnoted statement of this owner's support. It should be noted though that Reserve has an unrecorded agreement with Baja Properties on this property that presumably allows Reserve's infiltration ponds and monitoring wells on the Baja property, as well as access rights across this property.[9] So there may well be an outside motivation on Baja's part to 'support' Reserve's proposal.

The County Exec's staff in 2012 concluded "*Forestry is the use most compatible with the surrounding land use.*" And that "*… residential development on this site could result in conflicts with adjacent forestry and mining.*" And "*…… a cluster subdivision and open space would likely not prevent conflicts* [on adjacent properties]."[10]

Given the above, we conclude that ***the current Reserve proposal is NOT supported by all the adjacent owners, and*** furthermore, that this proposal ***is NOT compatible with either the adjacent FPD lands, nor with the adjacent Rural-zoned Natural Area/Open Space lands***.

2.7 Doesn't Reclamation for Forestry Conflict with the IFC and UW Study Conclusions?

To contest the County Executive's 2012 recommendation to return the post-reclamation Reserve Silica property to a Forestry zoning, Reserve commissioned two studies to assess the forestry potential of the property – one by International Forestry Consultants, Inc. (IFC),[1] and one by the University of Washington School of Environmental and Forest Sciences (UW).[2]

The key conclusion drawn by IFC is that, largely because of the impacts of decades of mining and dumping on the property, and a lack of any forest management over the mining tenure, a typical industrial timberlands investor (e.g., a Weyerhaeuser, Hancock, or Plum Creek) would not be interested

in purchasing the Reserve property in whole for long-term commercial forestry uses. This key conclusion is seconded by the UW study - and we fully agree with this.

However, Reserve's interpretation from the IFC study is that making the land suitable "*for long term commercial forestry would require significant and impractical investment to create productive forest soils*" is misleading. First, both studies confirm that the soils on the majority of the property that can be used for forestry purposes (excluding the 50 acres of recently filled mine pits) are "average for Douglas-fir production"[3] (Site Class III or above). Second, the IFC study conclusions list a series of five separate 'considerations' that "*all combine to reduce capacity for large scale commercial timber production on the site*." One of these five considerations is described as "*expensive forest restoration needs.*" For Reserve to pull this factor out and portray it as the key factor driving the unsuitability of the property for long-term commercial forestry is misleading and self-serving. And in both studies, it is obvious that Reserve is including the Interim Reclamation Plan requirements (filling, grading and capping the huge mine pits that existed in 2012, and which at the time Reserve expected would require another 10+ years to complete) as part of their estimated "forest restoration needs." This Interim Reclamation work is required of Reserve regardless of whether the property is upzoned for residential use, or returned to a Forestry zoning. As such, these costs should NOT be considered "forestry reclamation" costs. And in neither study do the authors conclude that the forestry reclamation costs are "impractical." That is Reserve's interpretation, and it is not supported by the Rural Forest Commission,[4] nor by Reserve's May 1, 2016 proposal to reclaim 211 acres to "Managed Forest."

Reserve Silica mining pits in 2007. (Gene Criss, 2007, myspace.com)

The other key conclusion drawn by the UW study is that "*it does not appear that the Reserve Silica property could be clearly classified as forest land with long term commercial significance by …. King County*." This conclusion is addressed in Section 2.8, which demonstrates that if the forestry reclamation proposed by Reserve is implemented, and the UW assessment was updated to reflect this activity and today's conditions, the property would fully satisfy the definition of "forest land of long term commercial significance."

In conclusion, **reclaiming approximately 265 acres of Reserve's property for forestry would be compatible with the IFC and UW studies, and would comply with GMA and with King County's definition of "forest land of long-term commercial significance".**

2.8 Does This Property Meet GMA and King County Criteria for 'Forest Land of Long-Term Commercial Significance'?

Reserve Silica indicates that their contracted studies confirmed that the property does not qualify as 'forest land of long-term commercial significance' based on GMA or KC requirements, and thus should not be zoned Forestry and placed within the Forest Production District.[1]

The key conclusion drawn by IFC from their study is that, largely because of the impacts of decades of mining and dumping on the property, and a lack of any forest management over the mining tenure, a typical industrial timberlands investor would not be interested in purchasing the Reserve property in whole for long-term commercial forestry uses.[2] This key conclusion is seconded by the UW study - and we fully agree with this. But just because an industrial timberlands investor (e.g., a Weyerhaeuser, Plum Creek, Hancock type owner) would not be interested in purchasing the property, in whole, does not necessarily imply that the property is not suitable for long-term commercial forest use.

The key study that addressed this property's fit with GMA and KC definitions of long-term commercial forest lands is the UW study,[3] which concluded that "*it does not appear that the Reserve Silica property could be clearly classified as forest land with long term commercial significance by …. King County*." This study identified four criteria used by King County to determine forest land with long term commercial significance – (a) predominant parcel size ≥ 80 acres, (b) site characteristics make it possible to sustain timber growth and harvest over time, (c) adjacent residential development is scarce, and siting of future dwelling likely to limit any adverse impacts to forestry, and (d) predominant land use of the property is forestry. Of these four criteria, UW concluded that only criterion (a) was fully satisfied by Reserve's property, and criterion (b) was partially satisfied. As such, UW concluded that the Reserve property did not meet the County definition of forest land of long term commercial significance.

Since this 2012 assessment, the remainder of the non-Forest Production District lands west of Reserve is now ALL within the Black Diamond Natural Area, and thus will never have any residential development. All the FPD lands to the northeast, east and south of Reserve are under Conservation Easement owned by Forterra, which does not allow any permanent structures. The 39-acre FPD property on Reserve's west boundary is being used for forestry-related purposes, under a forest management plan approved and monitored by the County, and has no residence. And lastly, according to Reserve, the 13-acre FPD parcel to the west has been used as a residence and private woodlot.[4] If correct, this is the ONLY parcel ANYWHERE around Reserve that will ever support a residence. But current Google Earth imagery appears to indicate that even this parcel is not being used for residential use; and it is currently being taxed as current use forestland. So condition (c) from the King County list of factors clearly is fully satisfied by Reserve's property.

The UW's conclusion that condition (b) is only partially satisfied by Reserve's property, and that condition (d) is not satisfied, was based on conditions as of 2012 when UW evaluated the site. With the forestry reclamation plan recommended by AFM and included with Reserve's current proposal, and

applying this plan to the areas Reserve proposes to build houses on, both criteria (b) and (d) would be fully satisfied. As such, if the AFM reclamation plan is implemented on the 70% of the property recommended above, ***Reserve's property WILL fully satisfy King County's definition of forest land of long term commercial significance***.

Satisfying the KC requirements for forest land of long-term commercial significance should satisfy the 1994 GMA requirements. Note that the 1994 GMA definition is sorely out of date. The Rural Forest Commission estimated in 2012 that no more than 30% of the total timberlands within King County's FPD would satisfy the outdated 1994 GMA definition.[5] And evidence would indicate further declines since 2012.[6] With the proposed reclamation and forest management, the Reserve property could actually satisfy even the 1994 GMA criteria.

2.9 Why is Reserve Promoting Conversion to Rural Residential Development?

The 67 acres of largely undisturbed, 37 year-old, well stocked Douglas-fir plantations of AFM Type 2 is the primary existing forest resource of significant current value on the property. Portions of this are also located on the highest productivity soil on the whole property, being classified as Site Class II – above average for commercially productive forestland. Of these 67 prime acres, Reserve is proposing clearing 33 acres, half the area, for the north Development Area. This development includes about 25 acres cleared for homesites, plus about 8 acres for 'open space buffers' between the housing clusters. For the 34 acres outside the north Development Area, as well as the 8 acres of 'open space buffer' strips Reserve is calling for a thinning to retain a forest cover while improving the aesthetics of the surrounding forest for the north residential development. In such a commercial thinning, Reserve could easily remove over half of the merchantable timber value on the site, and still leave a very attractive and more 'open' forest. And the 25 acres that are to be cleared for the north development would essentially be clearcut. As such, Reserve could realize approximately $292,000 of net stumpage value through the clearing of the north homesites, and the thinning of the surrounding stand and buffers, in addition to the value of the 32 residential lots in this north Development area.

The 38 acres of the south Development Area lies within AFM Type 7 (the 34 year old hardwood stand), and has very little net forestry value today. The reclamation plan is to thin this stand at break-even, then to hold it for 15 years for a commercial clearcut that would hopefully generate sufficient net revenue to cover the herbicide treatment and planting cost to establish a conifer plantation. So we don't attribute any near-term net forestry value to the existing forest in the south Development Area.

The sales value of selling 72 homesites to a developer in today's real estate market should realize something on the order of $40,000 per homesite,[1] or $2.88 million. So by getting an upzone to RA-10 and approval to install a 72-unit housing development, Reserve stands to gain ~$2.7 million above what the forestry retention option might be expected to yield ($2,880,000 value of selling rights to develop 72 lots to a developer + $292,000 net forestry proceeds from clearing homesites and thinning surrounding stand - $426,225 net value of Stand 2 if clearcut today and replanted). However, 25 of these 72 development credits would come from Reserve's Black Diamond property (now under ownership of

Reserve Silica's sister company, Reserve Properties, LLC), thus likely reducing the value of that property by ~$1.0 million (25 development rights at $40K/lot sales value to a developer). So the net benefit to Reserve if they can get the upzone and development approval is likely something on the order of $1.7 million, over the option of retaining the land for forestry.

As such, it would appear that ***the driving force behind Reserve's aggressive lobbying efforts for the proposed Demonstration Project and an upzone to their property is NOT to avoid a "significant and impractical investment" to reclaim the property for long-term forestry, but rather, it is the desire to capture the windfall profits of selling residential lots, while also stripping off most of the remaining timber value on the property through clearing for the residential development, and thinning the surrounding mature conifer stand for aesthetics.***

2.10 Who Would Buy These Lands From Reserve if Upzone Denied and Property Reclaimed for Forestry?

Frank Melfi, President of Reserve Silica, has stated that their desire is to sell off these lands and close out the Reserve Silica business.[1] The three principals of Reserve Silica/Reserve Industries are the three Melfi brothers, who are all in their late 70's and 80's, and two are experiencing major health issues. Gaining an upzone to the property to RA-10, and permission to establish a 72-home rural residential development on the property, would lead to a huge windfall profit for the brothers, as it would make the property of interest to potential residential development buyers – who, by the way, generally have no interest, nor expertise, in forest restoration or management.

IFC concluded, correctly we believe, that the typical industrial forestry companies (e.g., Plum Creek, Weyerhaeuser, Hancock, etc.) are not going to be interested in purchasing this property, even if all the proposed forestry reclamation tasks were initiated. The location of the property (too near to large urban populations), the highly degraded and fragmented condition of most of the existing timber resource through past neglect (other than the 73 acres of Types 2 & 6), the long time commitment to get the recently-filled mine pits to a point where they can support a commercial crop of timber (35+ years out), and the HIGHLY uncertain environmental risks on portions of the property (capped hazardous waste disposal sites, uncapped remediation area, plant site and 25' deep clay settling ponds, and unknown but potential contaminants on other portions of the property), would turn most all typical industrial forestland owners away.

However, there are viable markets for this property – though not likely to a single buyer. The 67 acres of AFM **Type 2, including the north Development Area**, would, with a high degree of certainty, be of interest to Fred Wagner/Kurt Erickson, the adjacent property owners to the East. Not only is this adjacent to their existing ownership, but it is precisely the same type of timber they have been very successfully harvesting and replanting for nine years now. In addition, they have received approval from King County to fill two additional mine trenches that lie primarily on their existing property, but also run up onto Reserve's Type 2 ownership. Erickson has no practical means of accessing these trenches without crossing Reserve's Type 2 lands. Without the ability to cross Reserve's property and fill the upper portions of these mine trenches extending onto Reserve's property, filling of the bulk of the lower

trench areas on the Wagner/Erickson property would entail such major logistical and environmental problems that the County and Forterra (which holds the Conservation Easements on the Wagner/Erickson property) might prohibit Erickson from moving forward with filling of these trenches. So there is a highly-motivated buyer for this premier portion of Reserve's property.

Adding the 21 acres of **Type 1** lands to the Type 2 package would provide an independent (other than Wagner/Erickson) forestlands buyer good access to the Type 2 forest. This addition may also be of interest to Wagner/Erickson, as that would also provide a much better access route to their existing property to the east (access to the Wagner/Erickson property was originally across Reserve's Type 1 land, when Plum Creek owned both tracts). In addition, adding the Type 1 land would bring the total package up to 88 acres – above the 80-acre threshold required for siting a single-family residence on these Forest Production District lands, thus greatly expanding the pool of potentially interested buyers. Finding a market for the Type 2/Type 1 land should not be an issue.

The land owner adjacent to Reserve on the West, Chris Powell, owner of P&D Logging, has previously expressed to Reserve an interest in purchasing some of Reserve's land adjacent to his property. Frank Melfi declined to discuss options with him, because Reserve was pursuing the current large scale development project.[2] So there is an interested buyer for some of the lands on the west side of the property, particularly the 8 acres of **Type 8**.

The **capped hazardous waste sites, and the uncapped remediation area** downslope from the capped sites, are under Easements to Holcim, which has responsibility for the CKD hazardous wastes. This easement gives Holcim complete control of the surface, subsurface and groundwater under these 48 acres. These capped lands can never be used for any forestry or residential uses, and likely can never be used for any purpose whatsoever other than containment of the hazardous waste. As such, the land actually has a negative value. These lands should just be transferred over to Holcim. Significant portions of the **BPA powerline easement** are occupied by the two capped hazardous waste sites and the uncapped remediation area. So it would probably make sense to sell/donate the land underlying the BPA powerline easement to Holcim also. This would provide Holcim with ownership connectivity between the upper capped waste site (the Dale Strip Pit) and the lower capped waste site (Lower Disposal Area).

The 55-acre **wetland complex** is adjacent to the almost 1,000-acre Black Diamond Natural Area. Adding this King County classified Class 1 wetland to the Natural Area under County ownership would be a great addition.

The 52-acre **plant site and clay ponds** are also adjacent to the Black Diamond Natural Area, with the plant site separated from Ravensdale Lake only by the Burlington Northern rail line. Some kind of public ownership for this portion of the property, as Open Space lands, would probably make the most sense. Wagner/Erickson may also be interested in purchasing portions of this property to service (e.g., wheel wash, check station, office) their existing ownership, as the Conservation Easement on their current property does not allow any permanent structures or development that could accommodate these facilities.

The 68 acres of property comprising the **Type 7 and the south Development Area**, south of the powerlines, and east of the wetlands complex, excluding the newly filled mine pit, would likely be attractive to a private investor who wanted to purchase their own, private forest. Including the ~28 acres of the recently filled, to-be capped and alder-planted mine pit south of the BPA powerline (**Type 4-south**) would bring this ownership to 96 acres - above the 80-acre minimum to establish a single family residence within the Forest Production District, making the tract attractive to "family forest" owners who tend to be more focused on a combination of timber production and secondary forestry benefits.[3] This could greatly increase the pool of interested buyers for this tract. This acreage also abuts the Wagner/Erickson property on the east and south and is accessible from the Wagner/Erickson property, potentially making this acreage of interest to Erickson as well.

The 6 acres of **Type 6**, in the SW corner of the property, is another 37 year-old, fully stocked Douglas-fir plantation, which is isolated from the remainder of the property by the wetland complex. It has good road access off the Black Diamond-Ravensdale Road, but It is also adjacent to part of the Wagner/Erickson property, so may well be of interest to this party, or would be a great addition, along with the wetland complex, to the Black Diamond Natural Area.

This leaves only the ~22-acre northern portion of the recently filled, to-be capped and alder-planted stand (**Type 4-north**). Finding buyers for this piece may be a challenge. Including it with the Type 2/Type 1 parcel may be the best marketing option.

In conclusion***, given a willingness to market the property in large pieces following forestry reclamation work, there should not be major issues in finding viable, interested and willing buyers for the portions of the property located outside of the cement kiln dust disposal and remediation areas.***

2.11 Conclusions: Reclamation for Forestry

The data does not support Reserve's foundational assertion that it would be impractical to reclaim the property to a point where it could support viable stands of commercial timber.

Our analysis, based on data and recommendations from Reserve's consultants, would indicate the forest reclamation costs to reclaim 70% of the property for forestry to be on the order of $70,000; and the net stumpage value available from harvesting the existing merchantable Douglas-fir plantation on the property would be on the order of $400,000 - implying a net income from the timber harvest and forest reclamation of ~$330,000. The estimated net value to Reserve if they can gain approval for the upzone and 72-unit development is on the order of $1,700,000. In all likelihood, Reserve's primary motivation in pushing the upzone and development proposal is not to avoid high reclamation costs, as they contend, but to realize the windfall from selling residential lots to a developer.

With the recommended forestry reclamation, this property would fully meet GMA and King County's definition of 'forest land of long-term commercial significance'. Recognizing Reserve's desire to divest of this property, we anticipate very viable markets for this property, if it is sold in large (>80 acre) blocks.

3.0 WHAT ARE THE ENVIRONMENTAL RISKS AND HUMAN HEALTH HAZARDS ON THE PROPERTY?

3.1 Executive Summary: Health and Environmental Concerns

Several health and environmental issues associated with the Reserve Silica property raise serious concerns with respect to siting a 72-unit rural community on the property. As of January 2016, this site was ranked as a priority 1 MTCA cleanup site.* Chief among the site hazards is the Cement Kiln Dust (CKD) that was disposed of on the site from 1979 to 1989. Two unlined pits containing ~350,000 tons of CKD have been capped, and are being monitored. However, monitoring in 2007 showed leachate with extremely high pH, arsenic and lead levels escaping from the lower pit. Ongoing efforts to control this leachate since 2007 have been unsuccessful. The Washington Department of Ecology (WDOE) has concluded that soil, surface water, and shallow and bedrock groundwater aquifers are contaminated.

The WDOE's January 2016 Site Hazard Assessment identified the risk to Human Health as extremely high (4.4 on a 1-5 scale). Measurements of water leaching from the site in April 2016 were found to have pH levels in excess of 12.0, high enough to potentially cause physical harm to people and animals coming into contact with it. Contaminated ground and surface water has already migrated off-site, beyond the control structures, and is now within 800' of Ravensdale Lake and Ravensdale Creek. WDOE scored the Migration Potential of the contaminated groundwater at the highest rating possible.

Reserve's proposal calls for the CKD pits to be included as open space lands, and managed by the Homeowners' Association. The HOA would also be responsible for reclamation and management of the 211-acre "managed forest," which includes the area highly contaminated by CKD leachate and the structures intended to contain and control this contamination source. It is totally unrealistic to expect the HOA to have the expertise or financial wherewithal to manage these highly technical issues. And as proposed by Reserve, the Conservation Easement to be owned by King County would put King County in a position of responsibility for management of these hazardous waste leachate areas as well.

Reserve's solution to protect future residents from this known CKD risk is "*institutional controls such as fencing and signage.*" Common sense would say this is an ineffective means to avoid human contact with these known toxins, particularly in light of the numerous children who would be living in close proximity, not to mention exposure risks to the HOA representatives who would be tasked with overseeing and managing these hazardous lands under the provisions of Reserve Silica's proposal.

Reserve proposes the use of on-site septic systems, and public water provided by Covington Water District sourced from off-site wells. The additional 10 million-plus gallons of groundwater flow introduced through septic drainfields from a 72-unit rural community, directly above and as little as 400' distant from the capped CKD pits, will only add to existing groundwater and surface water contamination problems, making effective control even more difficult.

While WDOE has tested for arsenic, lead, manganese and potassium in the CKD contaminated soil, surface and groundwater, studies have shown many other toxic chemicals are commonly associated with CKD, including highly carcinogenic dioxins and furans. No testing for the presence of these highly toxic substances has been performed. Evidence also exists to suspect the possible presence of many other contaminants on the property, besides CKD. No testing has been performed for contaminants outside the capped CKD pits and the leachate control area below the lower pit. In addition, portions of the property are known to be underlain with coal mines that operated from the 1920s to 1940s.

Potential subsidence risk, as well as open portals, bore holes, air shafts, etc. pose additional physical risks to any development or persons on this site.

In summary***, the known hazardous CKD wastes, and their documented contamination of soil, surface and groundwater, is an uncontrolled and on-going problem. This poses serious human health and environmental risks, both on-site and off. Adding incremental waste water from 72 new houses, directly above and in close proximity to the capped CKD pits can only exacerbate the CKD contamination problem, and complicate the thus-far unsuccessful attempts to control this toxic source. And a much more thorough testing of the property for other toxins and risk factors, in other locations beyond the known CKD pits, should be mandatory before any residential use of this site whatsoever even be considered.***

*Washington Department of Ecology, Model Toxics Control Act: highest hazard ranking for potential risk to human health and environment.

3.2 What are the Environmental Risks and Human Health Hazards at the Ravensdale Reserve Silica Site?

Environmental risks and human health hazards are major concerns with the Reserve Silica property in Ravensdale. There are known hazardous wastes on the property from which contaminants are leaching, and which are still not controlled despite nearly 14 years of effort.[1,2,3] And there are potentially other risk factors with a significant likelihood of occurrence on this site for which tests and studies have not yet been conducted. Underscoring the seriousness of these concerns is the Washington Department of Ecology (WDOE) ranking of the site, effective January 26, 2016, as a highest priority, Level 1 MTCA[4] clean-up site[5] for potential threat to human health and the environment relative to all other Washington State sites assessed to this time.[6] This ranking is based on assessment of known contaminants on a portion of the site.[7] A full site assessment to identify other potential hazards has not yet been conducted.

3.3 Cement Kiln Dust (CKD)

For a description of Cement Kiln Dust, see Appendix 3-a What is Cement Kiln Dust?

One known hazardous waste present on the Reserve Silica site is cement kiln dust, or CKD. CKD is the extremely fine dust, or ash, that is collected in the stacks and pollution control filters of cement kilns. (See Appx 3-a "What is Cement Kiln Dust?".) While "dust" may sound relatively benign, CKD is actually an extremely caustic, alkaline substance with pH commonly in the range of 10.5-12.5[1] or greater.[2] CKD from the Ideal Cement plant in Seattle, the source of the CKD dumped at the Ravensdale site has been measured at a pH of 12.8.[3] Contact with the dust, particularly when wet, can cause serious burns, as happened to two young men who came into contact with CKD mud along one of the roads on the Ravensdale site in 1981 after losing control of their four-wheeler. The severity of their burns put them both in the Harborview burn unit.[4]

When this highly alkaline substance comes into contact with water, the resulting leachate (i.e., the contaminated water seeping from the substance) is characterized "*as a Resource Conservation and Recovery Act (RCRA) corrosive waste . . . with pH levels commonly in excess of 12.5.*"[5] Leachate at the Ravensdale Reserve Silica site measured at two collection points in 2015 showed pH levels of 12.53 and 13.02.[6] On April 27, 2016, measurements of pH at five sampling points around the leachate collection and infiltration area ranged from 12.48 to 12.86.[7] Besides the pH issues associated with CKD, the other health and environmental risk is the presence of toxins including heavy metals and organic by-products. The US Environmental Protection Agency's (EPA's) analysis of CKD dust solids and leachate chemistry identified CKD as *"potentially contributing concentrations of arsenic, thallium, antimony, lead, chromium, total-2,3,7,8-substituted dioxins, and total hexachlorodibenzodioxin"*[8,9,10] to the environment. Other studies have also indicated the presence of furans in CKD.[11] These toxins are derived from both the feedstock materials used in the manufacture of cement and the fuel sources used to fire the kilns,[12] as well as from the combustion of these materials together in the kiln, which creates new compounds.[13,14] Besides the use of oil, natural gas and coal as primary fuel sources, tires and other organic wastes have also been used as fuel sources for heating kilns.[15] The extremely high temperatures in cement kilns (some of the highest temperatures of any industrial process), enable these kilns to

basically operate as waste incinerators, capable of burning most anything as fuel including municipal wastes, industrial wastes, medical wastes, etc.; as such, these kilns have been used as a means to dispose of these unwanted and undesirable materials.[16] Studies have shown extremely carcinogenic dioxins and furans are commonly associated with CKD when organic materials such as tires and medical wastes were used as a supplemental fuel sources in the cement kilns.[17,18] It is known that the Ideal Cement plant in Seattle (later Holnam Cement, then Holcim), the source of the CKD dumped at the Ravensdale site, burned ground tires as a supplemental fuel source for a period of time starting in 1986, and then again into the 1990s.[19] Holnam Cement is also known to have conducted several test burns using medical wastes as a fuel source.[20] However, it is unknown if this may have occurred during the period their CKD was being dumped at the Ravensdale site.

3.3a CKD on the Reserve Silica Property

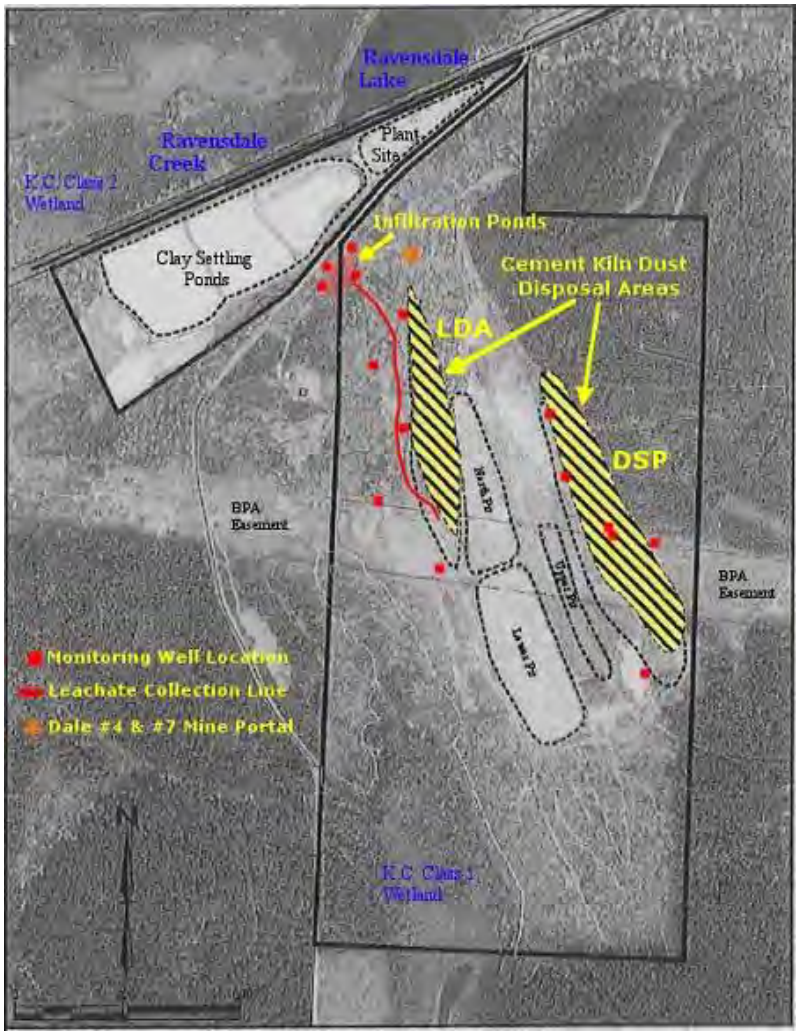
It is known that Reserve's predecessor, Industrial Mineral Products (IMP), and Reserve's own wholly owned subsidiary, L-Bar Products, Inc., disposed of CKD from the Ideal Cement plant in Seattle on the Ravensdale site from 1979 to 1989.[21] IMP sold silica sand (and ASARCO slag) to Ideal Cement for use in cement manufacturing and in turn, Ideal Cement disposed of CKD from their Seattle plant at the Ravensdale site.[22] Disposal of CKD in the unlined Lower Disposal Area (LDA) on the Ravensdale site began in June 1979.[23,24,25] This continued through 1982,[26] then disposal of CKD moved to the unlined Dale Strip Pit (DSP) and continued until 1989.[27,28] IMP oversaw dumping until 1986 when IMP was bought out by Reserve Industries, which then managed the site through its subsidiary, L-Bar Products, Inc.[29] L-Bar oversaw the disposal of CKD on the site from 1986 until 1989.[30] The estimated volumes of these known CKD deposits are 80,000 cubic yards (175,000 tons) in the LDA, and 83,000 cubic yards (182,000 tons) in the DSP.[31] However, in their January 2016 Site Assessment, under the heading "Current Site Conditions", Washington Department of Ecology (WDOE) states that "CKD might be present in other locations" [besides the LDA and the DSP].[32]

In 2002, Reserve Silica entered into an agreement with Holcim (USA) Inc., successor to Ideal Cement/Holnam Cement, the source of the CKD, for maintenance and monitoring by Holcim of the now capped CKD dump areas.[33,34]

3.3b Current Condition of Known CKD Deposits

The LDA was closed to all forms of dumping in 1985, and the DSP in 2003.[35] Both areas have now been capped with clay and soil to minimize surface water penetration. Thirteen groundwater monitoring wells have been established on the property, plus two additional on the adjacent property to the west, to measure the levels of pH, arsenic, lead, and manganese leaching from these CKD disposal areas. In addition, there are four surface water monitoring sites, including the infiltration ponds that cover about 1/10-acre on the adjacent property where CKD leachate is allowed to soak into the ground. And lastly, there is a monitoring point at the collapsed portal of the old underground coal mine shaft located below the DSP for testing of ground water seeping from the former mine tunnels. Regular monitoring of these wells and surface water sites has been conducted since 2005.[36]

When monitoring showed leachate problems at the LDA, the soil cap was upgraded in 2007,[37] the cover re-graded, and a surface water diversion ditch was constructed in 2007 to try to control surface water infiltration into the CKD.[38] When these measures failed to control leaching from the LDA, WDOE concluded that the primary cause of seepage was from groundwater flowing into the disposal area, rather than surface water infiltration. Between 2008 and 2013, a trench system was installed to collect the seepage from the LDA and direct it to infiltration ponds partially located on Reserve property and partially on the adjacent neighboring property.[39] WDOE studies concluded that the bedrock aquifer groundwater was rising at a vertical upgradient beneath the LDA, mixing with the shallow groundwater aquifer, flowing through the CKD, and then mixing back into the bedrock aquifer at a vertical downgradient beneath the LDA before flowing north and northwestward offsite. Groundwater in the LDA also discharges to the surface, where it comingles with storm water, before flowing into the three infiltration ponds.[40]



Cement kiln dust contaminate monitoring wells and leachate collection and infiltration facilities. (WDOE Water Quality Program. Recommendation for Enforcement Action. June 21, 2016. Original map base: Reserve Silica Ravensdale Quarry SWPPPS Map prepared by Bennett Consulting, PLLC, June 25, 2009.)

The problem of uncontrolled leachate was reported in a 2014 King County Public Health Department inspection report noting that leachate with a pH 11 to 12 was "*escaping/exiting the hillside north and downslope of the installed leachate catch basin. The volume of leachate appears significant and is not entering the system installed for conveying leachate to the downslope infiltration ponds.*"[41] This assessment is reinforced by Reserve's environmental and geologic engineering consultant, GeoEngineers' statement, "*Although the LDA and Dale Strip Pit have been capped ……, leachate from the LDA and Dale Strip Pits continue to present an environmental concern for impacts to groundwater, soil, and the exposure to leachate. Leachate (in the form of surface water) is seeping out of the west side of the LDA, and west of the LDA into collection ditches, which fall outside of the conveyance infrastructure in the marsh areas, the south pond area, and in the infiltration ponds. Although the conveyance and*

WA Department of Ecology monitoring photo: "Sample collection point, southwest corner of infiltration pond #1. Note "skin"/"film" related to elevated pH." (WDOE Water Quality Program. Recommendation for Enforcement Action. June 21, 2016.)

infiltration facilities are in place, the capture of leachate within collection ditching and inlet infrastructure has not been reliable. The uncontrolled nature of the leachate and impacted surface waters result in exposure pathways impacting human health and the environment that could be an ongoing concern depending on future land use type."[42]

2015 surface and groundwater monitoring for pH, arsenic, lead and manganese showed extremely high pH levels in surface waters around the LDA, and significantly elevated pH levels in the two shallow groundwater wells on the neighboring property (below the seepage collection trench and infiltration ponds). Arsenic concentrations exceeded Model Toxics Control Act (MTCA) cleanup levels near the LDA, found to be 7 to 30 times the designated cleanup levels in the surface waters; up to 8 times cleanup levels in the shallow groundwater in the off-site wells; and up to 2 times cleanup levels in the bedrock groundwater. Lead showed as exceeding cleanup levels in only one surface water test, and manganese did not exceed cleanup levels in any 2015 test (though reportedly, manganese levels have been significantly higher in earlier tests). At the DSP, two bedrock groundwater wells beneath the DSP showed arsenic levels exceeding cleanup levels by as much as 2.6 times.[43]

April 2016 measurements of pH levels by WDOE Water Quality again confirmed the presence of extremely high pH in the leachate collected from the LDA.[44] These findings led to the issuance of a WDOE Notice of Violation on June 29, 2016 for pH readings exceeding 12 at times and routinely exceeding the standards set in Reserve Silica's permit and in WAC Chapter 173-200.[45] The measured pH levels are described as "*high enough to potentially cause physical harm to people who contact the caustic discharge.*"[46] The Notice of Violation goes on to state, "*There is a potential for humans, particularly children, coming in contact with the* [leachate infiltration] pond *as the current fencing in not entirely prohibitive.*"[47]

WA Department of Ecology monitoring photo: "Description: pH meter reading of hard-pipe discharge [i.e., leachate discharging from collection system]. (WDOE Water Quality Program. Recommendation for Enforcement Action. June 21, 2016.)

These monitoring results would indicate that the toxic leachate associated with the CKD, especially in the LDA, is as yet uncontrolled, having now extended beyond the seepage collection trench and infiltration ponds that were installed as recently as 2013, and is affecting the adjacent property.[48] This indicates the contaminated ground water has migrated something more than 800' within the past nine years, and is now something less than 800' distant from Ravensdale Lake and Ravensdale Creek. The DOE has

noted the subsurface geology in this area to be "*Sand and gravel, fractures in bedrock*",[49] and scored the Migration Potential of the contaminated groundwater at the highest rating possible.[50] The extensive subsurface water flow through this area has been documented by other studies as well.[51] As such, the risk to Ravensdale Creek and Lake Sawyer would seem substantial and imminent. (WDOE believes the CKD leachate does not pose a risk to Ravensdale Lake at this time as they believe the Lake to be up-gradient from the CKD disposal areas.[52])

The Washington Department of Ecology's January 2016 Site Hazard Assessment evaluation found ground water to be in direct contact with the CKD fill, and the site to be contaminated with arsenic and lead.[53] Based on the January 2016 findings, WDOE classified the site as Class 1 (on a scale where 1 represents the highest relative risk and 5 the lowest) MTCA toxic cleanup site.[54] This classification represents, "*an estimation of the potential threat to human health and/or the environment relative to all other Washington state sites assessed at this time.*"[55] Underpinning this WDOE classification was their rating of risk to Human Health as 4.4 (on a scale of 1 – 5, where 5 is the highest possible risk.)[56]

In addition, the 1996 study completed by Hart Crowser for the City of Kent Wellhead Protection Program identifies the ground downslope of the CKD disposal areas, and beneath the CKD infiltration ponds and two lower monitoring wells, as Vashon Recessional Outwash. This is a highly permeable geology, rated High for Aquifer Susceptibility, with high (600' - 1000'/day) hydraulic conductivity, and within the 5-Year Capture Zone of the Kent Springs/Lake Sawyer Wellhead Protection Area, and upgradient from the Kent Springs and the Covington Soos Creek Well Field.[57]

In conclusion, the 350,000 tons of CKD dumped into unlined pits on the property through the 1980s have now contaminated the soil, ground and surface waters with extremely caustic pH levels and extremely high levels of heavy metals, especially arsenic. In spite of fourteen years of effort to control this contamination source, the toxins continue to migrate, having now spread off-site. Future contamination of nearby public 'waters of the State' seems likely. Contact with contaminated surface waters pose a serious risk to human health.

3.4 Limitations of Past Testing and Monitoring

The CKD monitoring wells have identified groundwater contamination in the vicinity of the CKD pits, but Reserve Silica's consultant, GeoEngineers, points out that "*an investigation or conclusion around impacted groundwater limits* [i.e., the extent of this contamination]*, was not identified during this* [GeoEngineers] *environmental review, which is a potential environmental concern.*"[1]

Review of available records suggests no testing has been done on this property for toxins other than arsenic, lead and manganese (and some tests for potassium), a conclusion confirmed in comments made by WDOE staff,[2] even though numerous other toxins are known to be commonly associated with CKD, including extremely carcinogenic dioxins and furans, especially when organic materials such as tires and medical wastes were used as a supplemental fuel sources in the cement kilns generating the CKD.[3,4] It is known that the Seattle Ideal/Holnam Cement plant, the source of the known CKD dumped at Ravensdale between 1979 and 1989, used tires as a fuel source for a period beginning in 1986.[5] (This

cement plant also tested the use of medical wastes as a fuel source, though the exact time period when this testing occurred has not been discovered.[6])

While the CKD issue on this property has been well documented and continues to be studied, other potential toxins have not been investigated at all.

In addition to the CKD, other extensive filling activities have occurred on the site since at least 1971.[7,8] Prior to IMP's acquisition of the site lease in 1972,[9] the property had been used for the mining of coal from 1925[10] to 1946,[11] both via underground mine tunnels and surface strip mining. There were no documented mining activities on the site from 1947 to 1967,[12] but since 1967 the site has been used for open pit mining of silica sand.

The property has also operated as a fill site since the 1970s,[13] through backfilling of the mining pits with known and unknown materials. Filling operations were initially permitted under a grading permit issued by the KC DDES.[14] Solid waste permits were issued by Seattle King County Public Health in 1983 and 1987,[15] which allowed dumping on the site consistent with a landfill. Finally, in 2012, SKC Public Health issued an Inert Waste Disposal Permit that specified only soil material free of contaminants, radioactive and hazardous wastes could be dumped on the site.[16] Prior to issuance and monitoring of the inert waste permit in 2012, it is unknown what other waste materials may have been dumped at the site. In its January 2016 Site Hazard Assessment, WDOE states that other mining pits on the site were filled with unknown materials.[17]

GeoEngineers reports "*Potential contaminant sources other than CKD, have not been investigated based on the information provided for this environmental review, and remains a data gap.*"[18] And "*Due to the limited sampling locations and analysis included in the current water quality monitoring program, other potential sources and/or recognized environmental conditions have not been evaluated. Therefore, it is possible that surface and groundwater quality may present a risk to human health and the environment, which may dictate opportunities for future use of the property.*"[19] Washington Department of Ecology points out in their January 2016 Site Hazard Assessment that "*Additional sand-mining pits, ….. which were filled with unknown materials not expected to be CKD, are located on other portions of the property.*"[20] Reserve Silica's Environmental consultant, GeoEngineers, reports that the Environmental Data Resources report in the 'Phase I ESA' [Environmental Site Assessment] showed the property was "*listed as a landfill until December 1999; has suspected groundwater, soil, and surface water contamination by metals and corrosive waste, and had an industrial wastewater discharge permit as of September 1994.*"[21] The GeoEngineers' report also referenced 20 environmental violations on the subject property from 2002 – 2006, which were all shown as "closed"; however, no information on these violations was provided to the consultant for their evaluation of potential environmental impacts to the future use of the property.[22]

More recently, Reserve Silica was cited for a major violation in December 2012 when it was discovered by WDOE personnel that up to eight truckloads of highly alkaline material containing "soil conditioners/ drilling additives and lube oil"[23] had been delivered to the Ravensdale site by Seattle Tunnel Partners.

Testing of the material indicated pH levels between 10 and 12, far above the levels allowed in Reserve's Inert Waste Landfill Permit issued in July 2012 and by State law. Not only was the material far above the allowable pH limit, but WDOE was told that the material was being treated on site (i.e., at the Reserve Silica Ravensdale fill site where it had been dumped) with concentrated sulfuric acid in an attempt to neutralize the material. Apparently, the acid was being poured on the highly alkaline material, then mixed together using heavy equipment before being pushed into one of the mine pits. WDOE found some portions of the "mixed" material to still have a pH of over 11 while pools of unmixed acid had a pH of less that 1. WDOE personnel also noted during the same visit the presence of petroleum sheen on dirt and standing puddles of water – a separate violation of Reserve's permit.[24]

In spite of a very long, largely undocumented history of dumping on this site, no testing for other industrial wastes or contaminates on other areas of the property has occurred. But evidence of such contamination has been reported to the WDOE involving old air shafts above mine tunnels[25] as well as on the 53-acre portion of the property where the processing plant, equipment storage, and clay settling ponds are located.[26] The Reserve Silica development proposal calls for putting the processing plant area into forest but the potential for site contamination following years of use as an industrial site, starting with the Dale/Continental Coal Company coal processing facility in 1924, and continuing to the present day, is high. This portion of the property is on the banks of Ravensdale Lake and Ravensdale Creek, separated only by the width of the Burlington Northern-Santa Fe rail line.

In conclusion, this site has had a very long, and largely undocumented history of dumping. Testing for likely contaminants has been limited to a very small area of the property associated with the known CKD pits and the CKD remediation area, and has been limited to just a few of the toxins known to be commonly associated with CKD. Testing for dioxins and furans in the CKD areas, and a broader-based testing across other areas of this property should occur prior to approval of any development.

3.5 Other Potential Contaminants

3.5a Unknown Fill Materials

In addition to the CKD, other extensive filling activities have occurred on the site since at least 1971.[1,2] Prior to IMP's acquisition of the site lease in 1972,[3] the property had been used for the mining of coal from 1925[4] to 1946,[5] both via underground mine tunnels and surface strip mining. There were no documented mining activities on the site from 1947 to 1967,[6] but since 1967 the site has been used for open pit mining of silica sand.

The property has also operated as a fill site since the 1970s,[7] through backfilling of the mining pits with known and unknown materials. Filling operations were initially permitted under a grading permit issued by the KC DDES.[8] Solid waste permits were issued by Seattle King County Public Health in 1983 and 1987,[9] which allowed dumping on the site consistent with a landfill. Finally, in 2012, SKC Public Health issued an Inert Waste Disposal Permit that specified only soil material free of contaminants, radioactive and hazardous wastes could be dumped on the site.[10] Prior to issuance and monitoring of the inert waste permit in 2012, it is unknown what other waste materials may have been dumped at the site. In

its January 2016 Site Hazard Assessment, WDOE states that other mining pits on the site were filled with unknown materials.[11]

3.5b Permitted Fill

GeoEngineers points out that "*Without reasonable estimates of the volumes, locations, and makeup of strip mine backfill accepted prior to the 2012 Inert Waste Disposal Permit, the significance and extent of this contamination remains a data gap in evaluating impacts to the Subject Property.*"[12] Furthermore, under Reserve's current fill permits "*it is reasonable to assume waste with contamination concentrations up to the MTCA thresholds may have been used as fill. Soil accepted from the Highway 99 tunneling project, and other development sites in downtown Seattle represent this type of fill material that may contain contaminant concentrations up to the MTCA reporting limits. The cumulative result of using fill impacted by contamination concentrations less than MTCA reporting limits is a potential environmental concern due to soil exposure and groundwater impacts …*"[13] In other words, the cumulative impact of permitted fill below MTCA thresholds, particularly with exposure to soil and groundwater, could represent a significant environmental risk factor [i.e.: Individual truck loads of fill material may be below the MTCA limits, but the total concentration of contaminants from many, many loads being dumped together in the same location is unknown].

3.5c ASARCO Slag Road Ballast and/or Gravel

Industrial Mineral Products (IMP), headquartered in Ravensdale (see Section 6.5 *Who Was Industrial Mineral Products?* and Appendix 3-b *What is Copper Slag?*), was mining silica sand from what is now the Reserve Silica site from 1972 until 1986, at which time Reserve Industries bought out the assets of IMP. IMP also had a contract, through its subsidiary, Black Knight, Inc., to purchase copper slag from the ASARCO smelter in Tacoma.[14,15] From about 1973 through 1985 (when the ASARCO smelter closed, IMP ground and sold the copper slag as road ballast, fill material, driveway gravel, roofing granules, sand blasting grit, and feedstock for cement manufacture. In addition to high levels of arsenic, ASARCO slag was found to have a number of other heavy metals including lead, copper, and cadmium.[16,17,18] In 1986, the Washington State Health Department determined that besides these contaminants, ASARCO slag also contained radium.[19] Copper slag road ballast used in the log sort yards and other locations in and around the Port of Tacoma led to extensive contamination of these areas .[20]

Given IMP's widespread sales of ASARCO slag-based road ballast and other materials throughout the Puget Sound region through the 1970s and early 1980s, it would seem highly likely that IMP also utilized this material on the roads at their own Ravensdale silica sand mining operation. In a trip report from a 1983 visit to the Ravensdale site by Greg Wingard, he indicates that two samples of this slag material were picked up from the main road serving the mine pit area and provided to WDOE for testing.[21] However, WDOE was unable to locate any of these test results in response to a Public Records Request in 2013. However, Mr. Wingard recalls that the samples had been sent to WDOE's Manchester Laboratory, and results provided to both he and the WDOE at the time indicated the samples were "very high in arsenic, and the data confirmed that the slag was from ASARCO." [22] Further, a report filed with the WDOE in 2004 included a statement from a Reserve Silica employee stating "*I worked at the reserve Mineral plant in the Ravensdale area for approximately 5 years. I was told by older workers that ballast*

was hauled in from Asarco smelter and dumped on the premises ….."[23] However, the WDOE Site Hazard Assessment from January 2016 did not test for, nor address, this potential environmental and human health hazard.

3.5d Petroleum-based Contaminants

In his 1983 trip report to the Ravensdale site, Greg Wingard recorded observing a "rainbow sheen" on surface waters over a wide area near the mine pits on the site,[24] indicating possible petroleum-based contaminants. Reinforcing this possibility is the written employee statement included in a 2004 report to WDOE in which the employee stated, "*I was there and saw transmission fluid from heavy equipment being dumped within 100 feet of the lake by the mechanic, this has been reported many times over the years with no results."*[25] The property should be tested for petroleum-based product contamination.

3.5e Coal Tailings Contaminants

Reserve's environmental consultant, GeoEngineers noted that the ~10 acre coal tailings area on the north end of the property may be contaminated "*by heavy metals, carcinogenic polycyclic aromatic hydrocarbons (cPAHs), and other associated contaminants* ".[26] Given the close proximity of this area to Ravensdale Lake, testing for these toxins should be performed.

3.5f SR 520 Evergreen Point Floating Bridge Demolition

Reserve Silica's Ravensdale site has been approved by King County as the disposal site for concrete debris from the demolition of the SR 520 Evergreen Point Floating Bridge on Lake Washington.[1] Much controversy has surrounded the demolition in terms of where the demolition should occur, whether on barges in Lake Washington or at the KGM (Kiewit/General/Manson) site in Kenmore. This controversy is due to concerns about noise, dust, and the potential release of hazardous materials and toxins by the pulverizing of the concrete.[2] In addition to the contaminants typically found in concrete, there is added concern for the presence of asbestos from automotive brakes.[3]

Newspaper reports on the controversy end with the statement that, regardless of where the demolition work takes place, the concrete material will be loaded on trucks and taken "out of the city." That 'out of the city' location is the Reserve Silica site in Ravensdale. While this is just one more source of potentially hazardous waste to be disposed of on this site, the unknown potential for leaching of toxins from the material if dumped in the unlined Ravensdale mine pits is unknown. Of particular concern is the actual composition of the concrete material given that it was produced in the 1960s before heightened awareness and monitoring of contaminants in cement and other additives to the concrete. And if the material does contain elevated levels of asbestos, there is a question if the proposed 1' to 2' covering of soil[4] over the disposal area will be adequate to contain this material and prevent exposure of any future residents to this highly carcinogenic material, particularly given Reserve's proposal that portions of the filled pits be used for recreational activities including trails and a possible equestrian facility.

3.5g Was Industrial Waste "Fertilizer" Applied to Portions of the Site?

Reserve Industries' subsidiary, L-Bar Products, which operated the Ravensdale site from 1986 to ca. 1990, also operated a magnesium recovery plant in Chewelah, Washington. (See 6.3 Who Was L-Bar Products, Inc.?) L-Bar Products sold the waste material from this magnesium recovery plant as both a road deicer and as an agricultural fertilizer. This fertilizer was found to contain a number of toxic materials and a study ultimately characterized it as volatile, unpredictable, unsafe, and hazardous to farmland;[1,2,3] but not before it was widely sold and used on croplands in Eastern Washington and the Willamette Valley between 1986 and 1991. In addition, since 1987, Ideal/Holnam Cement sold a majority of its cement kiln dust (the same material being dumped at the Ravensdale site) as a liming agent/fertilizer for agricultural use in Western Washington.[4,5,6] And lastly, Industrial Mineral Products (IMP), operator of the Ravensdale site from 1972 to 1986, and of the Chewelah magnesium recovery plant prior to L-Bar, was also attempting to market waste materials from the Chewelah plant as fertilizer, even to the point of asking the Washington State University's agricultural experiment station in Puyallup to do testing of their fertilizer product for use in Western Washington.[7,8] (WSU declined to test the material.)

It is not known if any of the L-Bar/IMP fertilizer products or Ideal/Holnam Cement's agricultural liming products were delivered to or used on the Ravensdale site; however, such a possibility cannot be overlooked as these companies sought new uses and markets for sale of these waste products – perhaps even as a forest fertilizer. L-Bar's marketing of their agricultural fertilizers in Eastern Washington and the Willamette Valley between 1986 and 1991 coincide with the time when L-Bar was also operating the Ravensdale site. It is possible that some or all of these products could have been tested on forestlands on the Ravensdale site in an effort to prove a forestry use for these materials.

April 2002 Google Earth image showing the dramatic vegetation difference between the heavily timbered northeast and southwest areas (highlighted in blue) and the southern portion upland of the wetlands (highlighted in yellow). Also note the heavily timbered lands surrounding the Reserve Silica property that were harvested and replanted by BN Timberlands at about the same time as the timber stands of the Reserve property. The lands below the green line and to the east are zoned Forest and located within the Forest Production District. (Google Earth, ©2016.)

An indication of such possible testing is the markedly different timber conditions between stands in the northeast and southwest of the property (AFM Types 2 and 6, see Section 2.2, Figure 1) and the stand between these on the south end of the property (AFM Type 7).

Aerial photography from 1981 shows this entire area, along with the surrounding properties (all were owned by Burlington Northern Timberlands [BNT]at the time), to be heavily timbered with conifers. Aerial photography from 1983 indicates this entire area was clearcut harvested at the same time, likely in 1982. BNT practices at the time were to replant their clearcuts with Douglas-fir within one year of harvest – which is consistent with the conifer timber we observe on Types 2 and 6 today, as well as the timber that has been recently harvested from the adjacent properties. And yet today's timber on Type 7 has virtually no conifer surviving, and is instead predominantly big leaf maple and cottonwood, with a little alder.

What's to explain this apparent anomaly? Reserve reports they have done no forestry activity of any kind on any of their property. They did report some mining exploratory work in this area, but it doesn't seem realistic that this exploratory work would have killed ALL the conifer, and spared the hardwoods. And it seems highly unlikely that BNT would have skipped planting this portion of their ownership, or treated it differently from their surrounding property, particularly where this area was still zoned Forestry, was still included within the Forest Production District, and the silica sand mining lease was not encroaching on this area of the property.

Could a test application of IMP/L-Bar's magnesium industrial waste 'fertilizer' on this area be the explanation? Testing of the impacts of this fertilizer on Eastern Washington and Willamette Valley agricultural applications showed occasional extensive crop mortality (and even major health issues in animals who consumed the crops) and major long-term reductions in soil productivity – particularly where the soil pH was allowed to drop following fertilizer application.[9,10] In Western Washington, with its heavy rainfall (compared to Eastern Washington), the tendency is for soil pH to drop (become more acidic) over time. So it would seem plausible that a test application of the industrial waste as a forest fertilizer may have killed the conifers, leaving the naturally regenerating hardwoods to take over the site. And if they were trying to test the fertilizer, the Type 7 area is the logical place to test, as this portion of the property has good access and reasonable topography, and the adjacent Type 2 stand would serve as a 'control' for the test. And Reserve's consultant (IFC) remarked on the unusual absence of any second-growth stumps in this area. Some of the chemicals in the industrial waste fertilizer would be expected to accelerate decomposition of woody fiber.

This is all just circumstantial evidence, but it would seem highly plausible that IMP and/or L-Bar may have tested their industrial waste fertilizer on the young Douglas-fir plantation in an attempt to demonstrate the value of the product to augment forest growth. And the test failed, killing the conifers, just as L-Bar's products were found to be devastating to some agricultural crops. This is the best explanation we can come up with to explain the anomaly in the timber mix we see today on Type 7 versus Type 2 & 6 stands. Though circumstantial and speculative, it would seem there is sufficient evidence to justify testing this area of the property for toxins found to be associated with the industrial waste fertilizer IMP/L-Bar was marketing at the time, as well as the CKD 'liming agent' Ideal Cement was marketing.

3.6 Physical and Subsidence Risks

Portions of the property were mined for coal through underground shafts and tunnels from 1924 to 1946.[1] "*The primary hazards associated with underground coal mines are open adits or portals, sinkholes, and ground surface settlement.*"[2] A March 2012 Projected Land Use Classification study prepared for Reserve Silica mentions "*open mines and test mine pits …. In the forested areas*."[3] An open mine adit was also noted in a 1983 trip report to the site by Greg Wingard.[4] King County has mapped portions of this site as Coal Mine Hazard areas,[5] and GeoEngineers states that while underground chambers, adits and tunnels may have been closed or filled, the "*remaining uncompacted fill material and subsurface void space continues to present a subsidence risk. A Coal Mine Hazard Investigation or Assessment … is recommended* [by GeoEngineers] *to mitigate these subsidence risks prior to development.*"[6]

3.7 Risks to Human Health and the Environment Posed by Residential Development on the Site

3.7a Risks to Human Health

Obviously, the known and potential risk factors described above represent a serious risk to residential development on the site. Reserve's solution for the known CKD risk is "*institutional controls such as fencing and signage.*"[1] Common sense suggests that fencing and signage of the 20 acres of mowed, grassy fields over the CKD pits [required for the maintenance of the soil and clay caps on the CKD disposal areas], directly below and as little as 300' from 72 middle income households will not be an effective control measure. This is especially true given the high probability there will be many households with children. For curious, adventuresome children, fencing is likely to be little more than an enticing challenge to be overcome. And given that the highly caustic and toxic CKD leachate and storm water runoff from the site has already spread beyond the Reserve Silica property, how will contact with leachate beyond the perimeter of the property be prevented? The current proposal only calls for fencing the CKD pits.[2] Will potentially ever expanding areas of adjacent properties also have to be fenced to avoid human, and animal, contact with this dangerous material?

Reserve's proposal also calls for "*recreational opportunities for the residents on the property with the potential of an equestrian facility,*"[3] including pasture, stables and arenas.[4] And Reserve's proposal calls for the Homeowner's Association to "*be responsible for the long term protection of the open space* [including the capped hazardous waste sites]*, critical areas and managed forest* [including the uncapped hazardous waste remediation area]."[5,6] These recreational opportunities and homeowner management responsibilities present significant opportunities for public exposure to known and unknown toxins and other risks. And it is ludicrous to expect the homeowner's association to have the expertise to manage these complex, technical issues, or to have the funding to hire persons with the appropriate expertise to deal with these issues.

3.7b Environmental Risks from Development

Reserve has apparently recognized the folly of their 2012 proposal to rely on private wells for the development[7] given the known contamination of the shallow and bedrock aquifers under portions of

the property, and the unproven long-term, and as yet unsuccessful, ability of the capped, but unlined, CKD pits to contain toxic contaminants. The current proposal implies that Covington Water District will serve Reserves' proposed 72-home rural community.[8,9,10,11] If approved, this would necessitate extending this urban service an additional 1.5 miles into the rural area.

Reserve's plan also calls for the use of on-site septic systems as the site is not located within a sewer district.[12] This possibility raises the concern that the incremental waste water from this rural community, brought in from off-site by Covington Water and estimated to be over 10 million gallons per year,[13,14] and introduced into the groundwater as little as 400' distant and directly above the unlined CKD pits, could substantially exacerbate the as yet unsuccessful attempts to control the CKD ground water contamination, and possibly even accelerate migration of contaminated ground water towards Ravensdale Creek, and the Lake Sawyer/Green River basin as well as the Kent Springs and Covington Wellfield. This environmental concern was corroborated by DOE Water Quality program personnel.[15]

3.8 Conclusions: Health and Environmental Risks

This property has an unusually high level of environmental and human health risks.

Most notable is the 350,000 tons of CKD dumped into unlined pits on the property through the 1980s, which have now contaminated the soil, ground and surface waters with extremely caustic pH levels and extremely high levels of heavy metals, especially arsenic. In spite of fourteen years of effort to control this contamination source, the toxins continue to migrate, having now spread off-site. Contact with contaminated surface waters pose a serious risk to human health. And the increment to groundwater from the construction of a 72-unit development, on public water sourced from off-site, with on-site septic systems, in close proximity and directly above these unlined CKD pits, will likely pose an additional challenge to attempts to control this source of toxic contamination.

Finally, due to its long, and largely undocumented history of dumping on the property, there is a high probability of additional contaminants on the site, beyond the known CKD. In spite of this, there has been virtually no testing done to identify these likely risks.

Appendix 3-a What is Cement Kiln Dust?

Cement kiln dust is a fine powdery residue of ash collected from the stacks, flues, and air pollution control filters of cement kilns producing Portland cement, the basic ingredient in concrete products. The kiln dust contains elements of 1) the feedstock materials – the materials being heated and combined in the kiln to create the cement, 2) compounds in the fuel source materials – the materials being burned to heat the kiln, and 3) new compounds created in the extremely high temperature of the cement kiln.

Very simply, a cement kiln is a long, slightly inclined, rotating barrel, typically over 500' long in wet process kilns,[1,2] heated to extremely high temperatures by the burning of fuel source materials at the lower end of the barrel. Feedstock material is fed into the kiln at the upper end and slowly rotates and tumbles down the barrel towards the flame of the heat source. As the material moves closer and closer to the heat source, the chemical properties of the feedstock change and melt together to form a rock-like material called clinker, which drops out of the lower end of the kiln. This clinker is then mixed with gypsum and other materials and ground into the fine powder known as Portland cement.[3]

A portion of the 540 ft. long wet process kiln at Lafarge Seattle, formerly the Ideal/Holnam Cement plant. (pavementinteractive.org)

Feedstock materials to be fed into the kiln are crushed and mixed together into a product containing the appropriate amounts of the basic ingredients of lime, silica, alumina and iron oxide, plus other substances found in the source materials. The source materials for feedstock can come directly from mining operations of the raw materials, or from reprocessing waste products from other industries including blast furnace slag and steel slag[4] (and historically, copper smelting slag[5]).

A number of **fuel source** materials are used in cement kilns. Cement kilns operate at extreme temperatures, as high as 3,000° to 3,400° Fahrenheit, the hottest of industrial processes.[6,7] As such, they are capable of incinerating almost anything, leading to the use of a wide variety of fuel source materials in combination with the traditional fuel sources of coal, oil and natural gas. These supplemental fuel sources can include most any kind of industrial wastes, municipal wastes (garbage), organic hazardous wastes (e.g., solvents, paint thinners),[8] medical wastes, and whole or ground tires.[9,10]

Inside a cement kiln. (www.allwidewallpapers.com)

Traces of the elements contained in both the feedstock and the fuel source can be found in the cement kiln dust as a result of the combustion and heating of these elements together in the barrel of the cement kiln. The combustion ash and hot gases combine and are expelled from the upper

end of the kiln into air pollution control filters that collect the ash and gas particles while filtering air emissions from the stacks. Together, the ash and particulate residues collected from the air pollution filters are referred to as cement kiln dust.

Cement kiln dust is highly alkaline, measuring as high as 13 on the pH scale, and very corrosive.[11,12,13] Due to the highly caustic nature of cement kiln dust, contact with the skin can cause burns.[14] When mixed with water or with acids, cement kiln dust has been found to leach a wide range of toxic chemicals of varying, and somewhat unpredictable, composition, with variable rates and quantity of leaching over time, depending on a number of variables including the acidic level of the environment in which it is placed as well as the quantity and pH of surface and ground water or other substances flowing into and around the cement kiln dust.[15]

The most frequently reported hazardous leachates from cement kiln dust are arsenic and lead, but various studies, including a US Environmental Protection Agency analysis of cement kiln dust, have identified a variety of toxic constituents in both cement kiln dust solids and in the leachate including: arsenic, thallium, antimony, lead, chromium, and dioxins.[16,17,18,19] Other studies have also indicated the presence of furans.[20] The presence of dioxins and furans in cement kiln dust are primarily associated with the burning of organic compounds found in municipal wastes, medical wastes, and tires.[21,22,23] The leachates from cement kiln dust have been found to enter both ground water and surface water. In addition, water-cement kiln dust mixtures are defined as a corrosive waste under the Resource Conservation and Recovery Act (RCRA) with pH levels commonly in excess of 12.5.[24]

The long half life of many of the toxic materials found in cement kiln dust, and the variable discharge rates of these toxins into the leachate, means this hazardous waste will remain in the environment, and a risk to human health, for a very long time.

Connection to Cement Kiln Dust Dumped at Reserve Silica's Ravensdale Site

Industrial Mineral Products, Inc. (IMP) of Ravensdale mined silica sand from the Ravensdale site under lease from 1972 to 1986. At the same time, IMP also had the exclusive contract to develop and sell products derived from copper slag produced at the ASARCO Tacoma smelter.[25] One of the products IMP produced from the ASARCO slag was feedstock material for cement manufacturing which they sold to Ideal Cement (Holnam>Holcim) in Seattle.[26] In addition to the copper slag feedstock, IMP also sold silica sand mined from the Ravensdale site to Ideal for cement feedstock. In turn, Ideal Cement delivered their waste cement kiln dust to IMP for disposal on the Ravensdale site.[27] With the closing of the ASARCO Tacoma smelter in 1985, the sale of slag stopped, but the sale of silica sand and disposal of cement kiln dust at Ravensdale continued. In March 1986, the assets of IMP were purchased by L-Bar Products, Inc. (a wholly owned subsidiary of Reserve Industries Corp. and sister company to Reserve Silica Corp.). L-Bar Products continued the silica sand sales/cement kiln dust dumping relationship with Ideal/Holnam Cement . L-Bar Products oversaw dumping of cement kiln dust at the Ravensdale site from 1986 to 1989, during which time Ideal/Holnam was known to be burning ground tires as a supplemental fuel source for a period of time beginning in 1986.[28] Thus, it is likely that in addition to the extremely high pH and usual contaminants found in cement kiln dust, the material dumped at the

Ravensdale site may have had even further elevated levels of arsenic due to the high arsenic content of the ASARCO slag feedstock,[29] as well as possible dioxins and furans from the burning of tires by Ideal Cement as a supplemental fuel source.

Appendix 3-b What is Copper Slag?

Copper slag is the molten by-product from the heating and processing (smelting) of copper-bearing ore to extract the copper. The molten slag cools into a hard, black, rock-like substance, and contains many heavy metals concentrated from the raw ore from which the copper was smelted, with arsenic being an impurity frequently found in copper ore deposits.[1] The ASARCO Tacoma smelter processed copper ore with higher than average arsenic content.[2] Slag from the ASARCO smelter in Tacoma was laden with toxic metals including arsenic, lead, copper, cadmium, and other heavy metals.[3,4,5] Some slag from the Tacoma smelter was deposited in Commencement Bay where it cooled and hardened, creating a breakwater for an artificial harbor. Slag dumped and cooled on land was used as fill material, or ground and sold for a variety of purposes including cement manufacturing, building foundations, pavement, roofing granules, sandblasting grit, insulation, landscape rock, driveway gravel, and road ballast.[6,7] As a result of these uses, arsenic-laced ASARCO slag from the Tacoma smelter was disbursed throughout the region.[8]

ASARCO Tacoma Smelter. (WDOE – ASARCO: https://fortress.wa.gov/ecy)

Connection Between ASARCO slag and the Reserve Silica Ravensdale Site

Industrial Mineral Products, Inc. (IMP), Victor J. Hoffman, President, had the exclusive marketing contract for products derived from ASARCO slag through its subsidiary, Black Knight, Inc.[9,10] from 1973 until the ASARCO smelter closed in 1985.[11] During the same time period, IMP, from its corporate headquarters in Ravensdale, was mining silica sand from the Ravensdale site. A major ASARCO slag product produced and sold by IMP was ground slag for road ballast and driveway gravel. It is highly probable that IMP would have used these road ballast and gravel products for their own use on haul roads at the Ravensdale site during their mining and fill operations between 1972 and 1986. During a 1983 visit to the Ravensdale site, Greg Wingard reports picking up two samples of slag determined to be from the Tacoma ASARCO smelter;[12,13] however, WDOE was not able to locate this information in response to a 2013 Public Records request.[14]

In 1986, the assets of IMP, including the Ravensdale silica sand mining lease, were purchased by L-Bar Products, Inc. (wholly owned subsidiary of Reserve Industries Corp. and sister company to Reserve Silica Corp.), with Victor Hoffman remaining as president of L-Bar Products.[15,16]

4.0 Does Reserve's Current Proposal Meet The Requirements for a Mining Site Conversion Demonstration Project as Defined in King County Comp Plan I-203?

4.1 I-203 Requirements and Current Proposal

I-203 specifies five conditions a project must satisfy to qualify as a viable mining site conversion Demonstration Project. "*The demonstration project shall evaluate and address: (1) potential options for the use of a reclaimed mine site, including the feasibility of residential use and/or long-term forestry on the demonstration project site.*" The evaluation and feasibility assessment of a residential use of this site, as contained in the May 1, 2016 Demonstration Project proposal submitted by Reserve, is incomplete, inadequate and misleading. Of particular concern is the failure to even mention the substantial risk to human health such a proposed residential development on this site would pose. The Washington Department of Ecology has assessed the risk to human health[1] for potential exposure to the CKD-contaminated leachate and surface waters on this property at a 4.4 rating, on a 1 – 5 scale, where 5 is extreme risk to human health. And the DOE has expressed the opinion that exposure to these toxins is a very real possibility, even in spite of Reserve's proposal to limit the exposure risk with "signage and fencing".[2] Note that in Reserve's SEPA checklist for this proposal, they checked 'No' to the question of "*risk of exposure to toxic chemicals*" – clearly a misrepresentation of the facts.[3]

Also of very high concern is the risk posed by siting 72 homes, served by off-site public water and on-site septic systems, immediately above and in close proximity to the unlined CKD pits on the property; and how this would impact the ongoing (and as yet, unsuccessful) efforts to try to control, contain and cleanup the toxic contamination of surface and groundwater, that may already be threatening Ravensdale Lake and Ravensdale Creek, and eventually downstream public water sources at Kent Springs and the Covington Soos Creek Well Field. Further discussion of these environmental and human health risks can be found in *Section 3.7*. In Reserve's proposal, they indicate "*No significant adverse environmental impacts have been identified.*"[4] Once again, a misrepresentation, or at the very least, a minimizing of the likely impacts of the proposal.

Reserve's evaluation and feasibility assessment of the long-term forestry use of the site is also erroneous and misleading. Contrary to Reserve's assertion that reclamation of the site for long-term forestry use would require "impractical investment," our studies, based primarily on recommendations and data from Reserve's own contracted consultants,[5,6,7] would indicate the necessary forest reclamation costs are minimal, and conversion of the majority of the property to where it can support viable commercial forests over the long term is entirely practical. Further discussion of this conclusion can be found in *Section 2.2.*

The second criterion for evaluation specified by I-203 is "*the impacts to carbon sequestration as a result of reforestation, and for residential use …*" Reserve's contracted carbon sequestration analysis clearly favors a forestry use option over residential use, with their 'Do Nothing' option (unmanaged forest use) yielding double the net carbon sequestered over 90 years compared to Reserve's proposed

development option (107K tons sequestered under Do Nothing vs. 54K tons under residential development).[8] Reserve failed to analyze what should be the base case option, that of reclaiming the majority of the site for forestry, and rehabilitating and managing the forests for long-term commercial use. Under this option, the net carbon sequestered would undoubtedly favor the forestry use over the residential development use even more than their 'Do Nothing' option. This appears to be another instance of Reserve attempting to minimize data that does not support their proposal.

The third I-203 criterion requires a "*site design that compatibly integrates any proposed residential development on the … site with uses occurring on the adjacent rural or forest production district lands, …..*" As discussed in Section 2.6, this proposal is NOT compatible with either the adjacent FPD lands, nor with the adjacent and nearby rural lands, which are all designated Natural Area or Open Space lands.

The fourth I-203 criterion for evaluation is "*the levels and standards for reclamation of mining sites that are appropriate to their use either for long-term forestry and/or for residential development*."[9] Reserve's current proposal does a reasonable job of laying out recommended reclamation standards for both the forestry and residential use options. One key omission that should be addressed for both options, however, is what kind of toxic waste cleanup should be required as part of the reclamation process. The toxic contamination of soil, surface and ground water that they have been trying, unsuccessfully, to control for the past fourteen years is a direct result of the mining and dumping on the site. As such, reclamation is not complete until any and all mandatory, necessary, or WDOE-requested voluntary cleanup has been performed.

The final I-203 criterion is that "*the demonstration project provides an overall public benefit by providing permanent protection, as designated park or open space, of lands in the vicinity of the demonstration project site that form the headwaters of critical, high valued habitat areas; or that remove the development potential from nonconforming legal parcels in the forest production district; or that provide linkages with other forest production district lands.*" Clearly, this proposed project does nothing to remove development potential from nonconforming FPD parcels. And it actually destroys linkages with other FPD lands, leaving the two FPD parcels to the west isolated from the remaining FPD zone. So the key question with this I-203 criterion is whether the proposal provides 'an overall public benefit….'

Reserve claims that their proposal will "*… provide permanent protection to over 55 acres of wetland and wetland buffer*",[10] "*that serves as the headquarters* [sic, headwaters] *for Sonia Lake and Cinder* [*sic, Ginder*] *Lake open space.* ", claiming this as a key public benefit of the project.[11] Note that <u>nothing</u> in this proposal provides any additional 'protection' to this King County-designated Class 1 wetland complex that isn't already available under existing State and County regulations. This wetland is located in the portion of the property currently zoned Forestry and included within the FPD. And there has never been any documented mining disturbance to this wetland complex. Actually, contrary to Reserve's claim to a public benefit, siting 72 houses within as little as 150' of this wetland significantly <u>degrades</u> its 'protection' over the protections that currently exist, or that would be provided if the zoning on this portion of the property remained Forest and on the remainder of the property were to revert to Forestry. The proposed housing development "*is considered a high impact land use* activity"

by County wetland criteria.[12] And this decrease in protection is further exacerbated by Reserve's proposal to increase recreational opportunities for the residents, including the construction of trails and a possible equestrian center in the vicinity of this wetland.[13] As such, Reserve's proposal actually represents a significant negative net public benefit in terms of wetlands protection over current conditions, and certainly compared to the option of reclaiming the property for commercial forestry. It's also hard to argue that this wetland constitutes the '*headwaters of critical, high valued habitat areas*' as required in I-203. Virtually all of this tributary to Lake Sawyer runs through the Black Diamond city limits – hardly '*high valued habitat*'.

In Reserve's proposal package, they enumerate some of the other public benefits their proposal would provide.[14] However, they ignore the negative impacts to existing public benefits of the proposal. We have listed 21 different sources of potential 'public benefit', as derived from I-203 and from the FRCV Conservation Plan (adopted in the 2004 KC Comp Plan and embedded within the Greater Maple Valley/Cedar River CSA sub-area plan), and as listed in Reserve's proposal document. These potential sources of public benefit are shown in Table 4.1a. For each potential benefit source, we have identified the key public benefit impact on both the Black Diamond (TDR sending site) property, and on the Ravensdale (upzoned/receiving site) property. A green shading indicates a public benefit, a red shading indicates a negative impact to the public benefit, and a yellow shading indicates no impact or a neutral public benefit impact. And the final column of the table indicates the net, or 'overall' public benefit for each factor when considering both properties. While Reserve's proposal does provide several public benefits, primarily associated with their Black Diamond property, the net overall public benefit (last column) is clearly negative (mostly reds).

By way of reference, when the I-203 amendment was drafted and adopted in late December 2012, then Councilmember Larry Phillips, Reserve Silica, and Friends of Rock Creek Valley all envisioned the sending site being the 638-acre property formerly owned by Weyerhaeuser, located in Section 6 of Twp21N, Rng07E. See Figure 4.1. For brevity, this property was known as 'Section 6.' The analogous public benefits table for the envisioned 'Section 6 to Reserve Ravensdale Demonstration Project' is shown in Table 4.1b. Clearly, such an exchange would have easily met the 'overall public benefit' criteria of I-203, as well as all the other I-203 criteria as this was the property the amendment was designed to protect. To Reserve's credit, they went above-and-beyond in their efforts to try to purchase the development credits from the current owner of Section 6 (Carolem Corp. out of Hollywood, CA), but they were unsuccessful. It was only after these attempts failed that Reserve Silica, wishing to still reap the benefits of selling residential lots on their Ravensdale property, chose to purchase the Black Diamond property as a substitute sending site, and in the process growing the project from what would have been a 22-unit development under the intended Section 6 alternative to what is now a proposed 72-unit development.

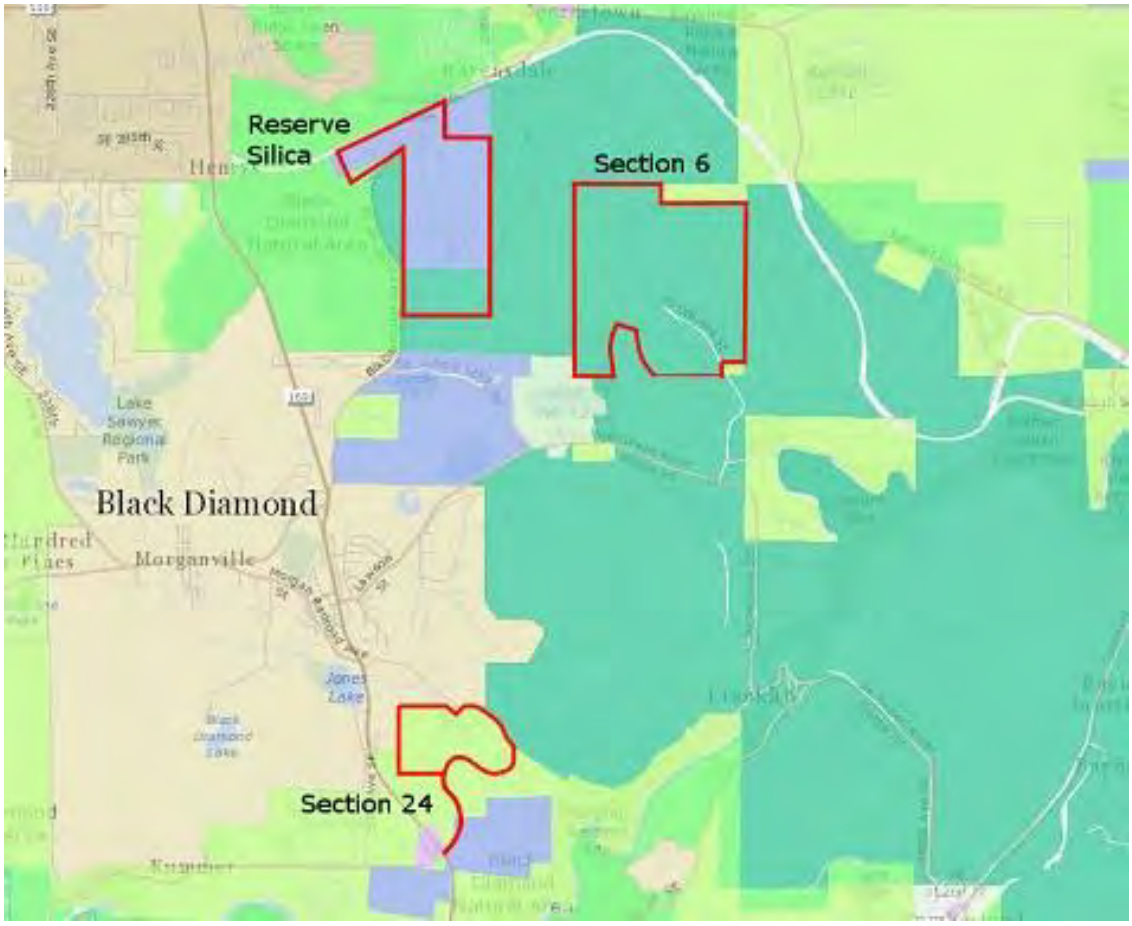
Given the above, we strongly disagree with Reserve's Development Agreement, under which the County would "*acknowledge and agree that the Reserve Rural Conversion Project* [i.e., the proposed I-203 Demonstration Project], *constitutes a public benefit by, inter alia, providing Commercial Forest, housing, carbon sequestration, reclamation of mined lands, preservation of wetlands that serves as the*

headquarters [sic, headwaters] *for Sonia Lake, and Cinder* [sic, Ginder] *Lake open space, and increased and enhanced equestrian recreational opportunities.*"[15] The commercial forest, carbon sequestration, wetland preservation and mining reclamation under this Demonstration Project proposal are all substantially less than the comparable benefits available from a forestry reclamation and Forest zoning option; and the increased and enhanced recreational opportunities accrue ONLY to the site's residents, not the public in general.[16] Furthermore, the reclamation of depleted mining lands is required regardless of which option is chosen. So the only net benefit from this list Reserve is asking the County to acknowledge is the increase in housing – which is antithetical to King County goals for Rural and Natural Resource lands.

In summary, ***Reserve's current proposal for a mining site conversion Demonstration Project does NOT meet ANY of the five criteria specified in I-203.***

Figure 4.1. Reserve Silica and TDR Site Location

Reserve Silica Ravensdale site in relation to location, acreage and zoning of intended Section 6 TDR site vs. currently proposed Section 24 TDR site.



Source: King County iMap.

Table 4.1a Demonstration of Net Public Benefit of Current Reserve Silica Proposal.

Public Benefit	Benefit to BD property	Benefit to Ravensdale property	Net Benefit
1. Protect Headwaters of Critical, High Value Habitat Area	Not headwaters	Wetland more at risk	Slight Negative
2. Remove Development Potential in Non-conforming FPD parcels	Not FPD	Adds development	Negative
3. Provide linkages with other FPD lands	No	Isolates parcels to W	Negative
4. Block Up FPD	Not FPD	Fragments FPD	Negative
5. Protect timber from development clearing	111 ac 2-yr old protected	52 acres mature cleared	Negative
6. Reduce potential conflicts with adjacent Resource lands	Minimal adj Res lands	Known + likely conflicts	Negative
7. Reduce housing density on Natural Resource lands	Not resource lands	Add'l 68 houses[1]	Negative
8. Reduce housing density on Rural lands	Net 25 house reduction	Net 40 house increase[2]	Moderate Negative
9. Block up lands protected from development	No	72-house island	Major Negative
10. Maximize acres under timber/open space Cons Easement	111 acres	275 acres[3]	Positive
11. Protect high-functioning wetlands	Temp wetland[4]	Wetland more at risk[5]	Negative
12. Block Up Wildlife Habitat	No	Houses break habitat	Slight Negative
13. Provide Wildlife Connectivity	Some	Yes (impaired by housing location)	Positive
14. Increase net carbon sequestered over 'Do Nothing' option	Some gain	Substantial Loss	Major Negative[6]
15. Maximize Acres protected/TDR from sending site	5 acres/TDR[7]	Not sending site	Negative
16. Enhance Urban-Rural Buffer	Some buffer for BD	res island >1 mi from UGB	Major Negative
17. Provide green space for urban area	Yes	Not adj to urban area	Major Positive
18. Minimize environmental impacts of development	25 house reduction	40-68 house incr; CKD[8]	Major Negative
19. Minimize exposure of residents to health hazards	No known hazards	Major exposure risk	Major Negative
20. Reduce traffic	-25 houses adj to BD	68 house increase	Negative
21. Reduce need for public services to serve development	-25 houses adj to BD	68 remote houses 1.5mi to public H_2O	Negative

It is VERY hard to make the case that the proposed Demonstration Project will yield an overall public benefit, as required by I-203.

[1] 72 proposed vs 4 currently allowed

[2] 72 proposed vs RA-10 on 327 acres=32 (377 acres-CKD-mitigation-coal tailings)

[3] 377 acres – 52 Dev – 20 CKD – 20 mitigation – 10 coal tailings

[4] County determined wetland is from beaver dam, determined to be temporary

[5] 72 houses will raise risk to wetland

[6] > 50% reduction in net carbon sequestered over 90 years

[7] Most sending sites would be F (80 acres/TDR), or Rural Forest Focus Area (RA-20) or RA-10

[8] 68 house increase over F zone; 40 house increase if zoned RA-10; houses represent major risk to efforts to control ongoing CKD contamination

Table 4.1b Net Public Benefits of I-203 Demonstration Project if Implemented as Envisioned[1] to Protect Section 6.

Public Benefit	Section 6	Ravensdale property	Net Benefit
1. Protect Headwaters of Critical, High Value Habitat Area	Very High, Rock Creek (Cedar)	Wetland slightly more at risk	Strong Positive
2. Remove Development Potential in Non-conforming FPD parcels	Yes, 18 parcels	Parcels conform	Positive
3. Provide linkages with other FPD lands	Already FPD	Yes, revert to F zoning	Positive
4. Block Up FPD	Already FPD	Yes, revert to F zoning	Positive
5. Protect timber from development clearing	638 ac 37-yr old protected	Slight reduction from 18 houses	Positive
6. Reduce potential conflicts with adjacent Resource lands	Yes, 18 houses reduced	No, 18 more houses	Neutral
7. Reduce housing density on Natural Resource lands	Yes, 18 houses reduced	No, 18 more houses	Neutral
8. Reduce housing density on Rural lands	Not Rural	Not Rural	Neutral
9. Block up lands protected from development	Yes, 638 acres	No, 18 add'l houses	Slight Positive
10. Maximize acres under timber/open space Cons Easement	638 acres	No Cons Easement	Positive
11. Protect high-functioning wetlands	Yes, Crow Marsh	Minor Wetland slightly more at risk	Slight Positive
12. Block Up Wildlife Habitat	Yes, Ravensdale Ridge	Slight decrease	Slight Positive
13. Provide Wildlife Connectivity	Yes, Cedar-to-Green	Slight decrease	Slight Positive
14. Increase net carbon sequestered over 'Do Nothing' option	Yes, 18 houses reduced	No, 18 add'l houses	Neutral
15. Maximize Acres protected/TDR from sending site	35 acres/TDR	Not sending site	Slight Positive
16. Enhance Urban-Rural Buffer	Not in buffer	No, 18 add'l houses	Negative
17. Provide green space for urban area	No	No	Neutral
18. Minimize environmental impacts of development	18 house reduction	18 house incr; CKD	Negative
19. Minimize exposure of residents to health hazards	No known hazards	18 house incr; CKD	Negative
20. Reduce traffic	-18 houses	+ 18 houses	Neutral
21. Reduce need for public services to serve development	-18 remote	+18 houses, less remote	Neutral

The Demonstration Project as envisioned when I-203 was written in December 2012 would have provided a substantial overall net public benefit.[2]

[1] 2012 Demonstration Project was designed and intended to transfer 18 development credits from Section 6 to Reserve's property; revert Reserve property to Forest-zoning, with 4 credits; install 22-unit clustered development; and permanently protect Section 6 in FPD at heart of Ravensdale Ridge from all future development.

[2] At the time I-203 was written and endorsed, the extent of the hazardous toxic waste issues on the Reserve Silica site were not known to Councilmember Phillips or FRCV. Knowledge of this information would have precluded support by FRCV for any residential development plans whatsoever on the property.

4.2 Is Reserve's Current Proposal Consistent with King County Policy and Goals?

To upzone Reserve's property to Rural Residential and approve a 72-unit rural community on the property would violate at least 20 existing, long-standing King County policies, as well the Greater Maple Valley/Cedar River CSA sub-area plan.

Policy R-691

Of primary significance to this proposal is policy R-691, which deals with mining site reclamation. This policy states that "*Reclamation of mining sites in the Forest Production District should return the land to forestry.*" Reserve's property south of the Black Diamond-Ravensdale Road IS within the FPD. These lands were zoned Forestry in 1985, and placed within the original FPD,[1] as part of the BN/Plum Creek timberlands operating block. (See Figure 4.2a.)[2] The FPD boundary followed the Black Diamond-Ravensdale Road, and also included the current Powell and Baja Properties parcels, thus blocking up the FPD as required by GMA. This situation is confirmed by Reserve,[3] stating "*The '85* [Comp] *Plan did include the RS* [Reserve Silica]*, Sanders* [now Baja Properties] *and Read* [now Powell] *properties in the FPD.*" The Mining zoning was a temporary overlay added later (ca. 1996) and, according to the Rural Forest Commission,[4,5] this zoning was approved by Reserve's predecessor - Plum Creek Timberlands. As such, R-691 would indicate the property should be reclaimed for forestry, revert to its original Forestry land use and zoning, and be included within the FPD.

Reserve argues that King County does not currently show most of the property (other than the southernmost 80 acres) as being within the FPD, and thus the mining portion should fall under the R-691 provision which states "*When reclamation of mining sites located outside of the Forest Production District in completed, the site should be considered for redesignation to a land use designation and zoning classification compatible with the surrounding properties.*" But as noted in Section 2.4, a Rural Residential land use and zoning would be incompatible with the surrounding FPD lands, which occupy 77% of Reserve's perimeter; and would also be incompatible with the remaining 23% of surrounding lands that are designated Natural Area and Open Space lands. (See Figure 4.2b.) As such, even under this provision, the Reserve property should revert to a Forestry Land Use and Zoning.

The southernmost 80 acres of Reserve's property is clearly currently zoned Forest, and is included within the FPD. Reserve's proposal would ALSO upzone these Forest-zoned lands to Rural Residential. But R-621 and R-623 address this issue, stating "*Lands may be removed from the FPD only through a subarea study, and only to recognize areas with historical retail commercial uses.*" The applicable subarea study, the Greater Maple Valley/Cedar River CSA sub-area plan, does not provide for such an upzone, and this area certainly has no "historical retail commercial uses."

Policies R-208. R-302, and R-334b

Even if the property were to be upzoned to Rural Residential, this is still within a Rural Forest Focus area. Policies R-208, R-302, R-330 and R-334b address this issue, stating "*The Rural Forest Focus Areas should be maintained in parcels of 20 acres or more in order to retain large, contiguous blocks of rural forest.*"

Reserve's clustered proposal has an average lot size of less than ¾ acre each. Even crediting the 72 clustered lots with the full 377 acres of the property yields an average lot size of just over 5 acres – far short of the 20-acre Rural Forest Focus Area target.

Policies E-462, E-495, E-496, and E-497b

These policies all address protecting groundwater supplies. Siting 72 houses on septic, with public water provided from off-site, in close proximity and directly above capped CKD disposal areas already infiltrated with bedrock and shallow aquifer groundwater,[6] is a major groundwater contamination threat from an as yet uncontrolled[7] toxic source.

Policies R-334d, R-201i, and R-629

These three policies address providing public utilities and services. For example, R-334d states "*Clustering of lots* [in the Rural Area] *is permitted when ….. the development can be served by rural facility and service levels (such as ….private well(s) for on-site water supply…)….*" This development is to be served by Covington Water,[8,9] due to the contaminated groundwater supplies on portions of this site. This service will require extending Covington water mains an additional 1.5 miles further into the Rural Area/FPD,[10] and will require an expansion of the designated Covington water service area.[11]

Policy R-684

Policy R-684 states "*The preferred adjacent land uses to sites designated as Mining on the Land Use Map are mining, industrial, open space or forestry uses.*" The Wagner/Erickson parcel adjacent to Reserve's NE corner is zoned Mining, and is a viable coal resource. So assigning a Rural Residential Land Use to Reserve's property located adjacent to the Wagner/Erickson mining zoned property, and constructing 32 homes on the northern Development Area in close proximity to this mining-zoned site, is a clear violation of Policy R-684.

Policies R-312, R-313, R-314d & e, R-319, and R-322

These six policies all address the use of TDR's, with the key goal stated as "*encourage higher densities in urban areas and reduce residential development capacity in Rural Area and Natural Resource Lands.*" In brief, the proposal distributed by Reserve on April 6, 2016 (at the Ravensdale KC Council meeting) and in their expanded May 1, 2016 proposal, is to upzone the Ravensdale site to RA-10; transfer 25 of the available 28 development credits from their Black Diamond Section 24 property to the Ravensdale site (a rural-to-rural transfer); purchase 9 TDRs from the King County TDR bank; build a 72-unit housing development at Ravensdale; place 126 acres of Section 24 under conservation easement, and sell the remaining three 5-acre parcels on Section 24 for residential development.[12]

Under this scenario, the total houses on Reserve's two properties (the Ravensdale site [Rav] and the proposed Black Diamond Section 24 TDR sending site [BlkD]) would increase by 43 units (72 on Rav plus 3 on BD = 75 units vs. current zoning of 28 on BlkD plus 4 on Rav zoned Forest = 32 units). This proposal would also increase the total houses on what is now Natural Resource Lands by 68 units with the siting of 72 homes on the Ravensdale site vs. four if the site reverted to Forestry zoning. Further, if the Ravensdale upzone is approved, the proposal would increase the total number of houses in the Rural

Area by 14 units (72 on Rav plus 3 on BlkD vs. 33 on RA-10 upzoned Rav +28 on BD). This proposal also requires a Rural-to-Rural TDR, which is highly contested and in violation of R-319. There is nothing in the I-203 mining site conversion Demonstration Project amendment which explicitly endorses a Rural-to-Rural TDR transfer; and serious thought should be given as to the wisdom of setting a Rural-to-Rural transfer precedent.

Recognizing the likelihood of widespread opposition to a rural-to-rural transfer of development credits, Reserve's consultant noted that Reserve is also considering a variation to their published proposal above. In brief, this alternative proposal would be to donate 25 of the available 28 development credits from the Black Diamond Section 24 property to the King County TDR bank; up-zone the Ravensdale site to RA-5; build a 72-unit housing development at Ravensdale; (presumably) sell or donate the three extra development credits from the Ravensdale site to the King County TDR bank; place 126 acres of Section 24 under conservation easement, and sell the remaining three 5-acre parcels on Section 24 for residential development.[13]

Under this thinly disguised attempt to technically avoid a rural-to-rural transfer, the total houses on Reserve's two properties would still increase by 43 units. Plus, in donating 25 TDRs from their Black Diamond property, and donating or selling another three from the Ravensdale property (a RA-5 upzone would give them 75 units on the Ravensdale property), the total houses in the Urban area would also increase by 28 units. That is a net increase of 71 housing units – 43 in the rural area and 28 in the urban area!

Clearly, neither of the above scenarios do anything to further the goal of reducing residential development capacity in the Rural Area and Natural Resource Lands. Rather, both proposals would more than double the number of houses in the Rural Area/Natural Resource Lands over the density permitted under the current RA-5 zoning on the Black Diamond Section 24 property and a return of the Ravensdale property to a Forest zoning ([72+3]/[28+4]).

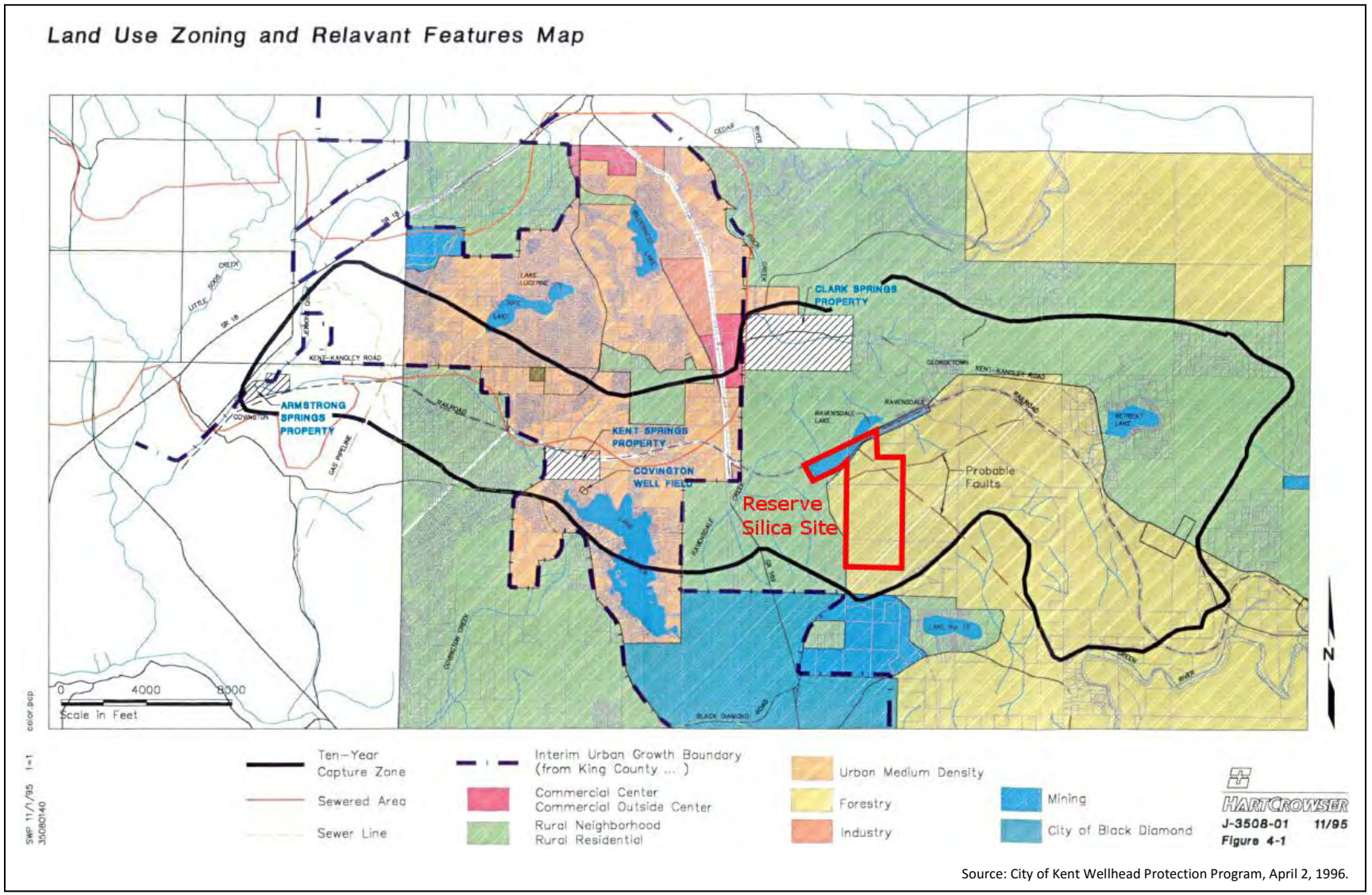
Policy CP-1105

Finally, CP-1105 reinforces the "*conservation of natural resource lands and environmentally sensitive area through community efforts such as the Rock Creek Valley Conservation Plan and the Friends of Rock Creek.*" The RCV Conservation Plan was adopted by the County in 2004. This upzone proposal does NOT comply with the RCV Conservation Plan, nor with the Mission/Goals of the FRCV.[14]

In conclusion, ***Reserve's current proposal is a direct violation of many, long-term existing County policies.***

Figure 4.2a Forestry Zoning 1995

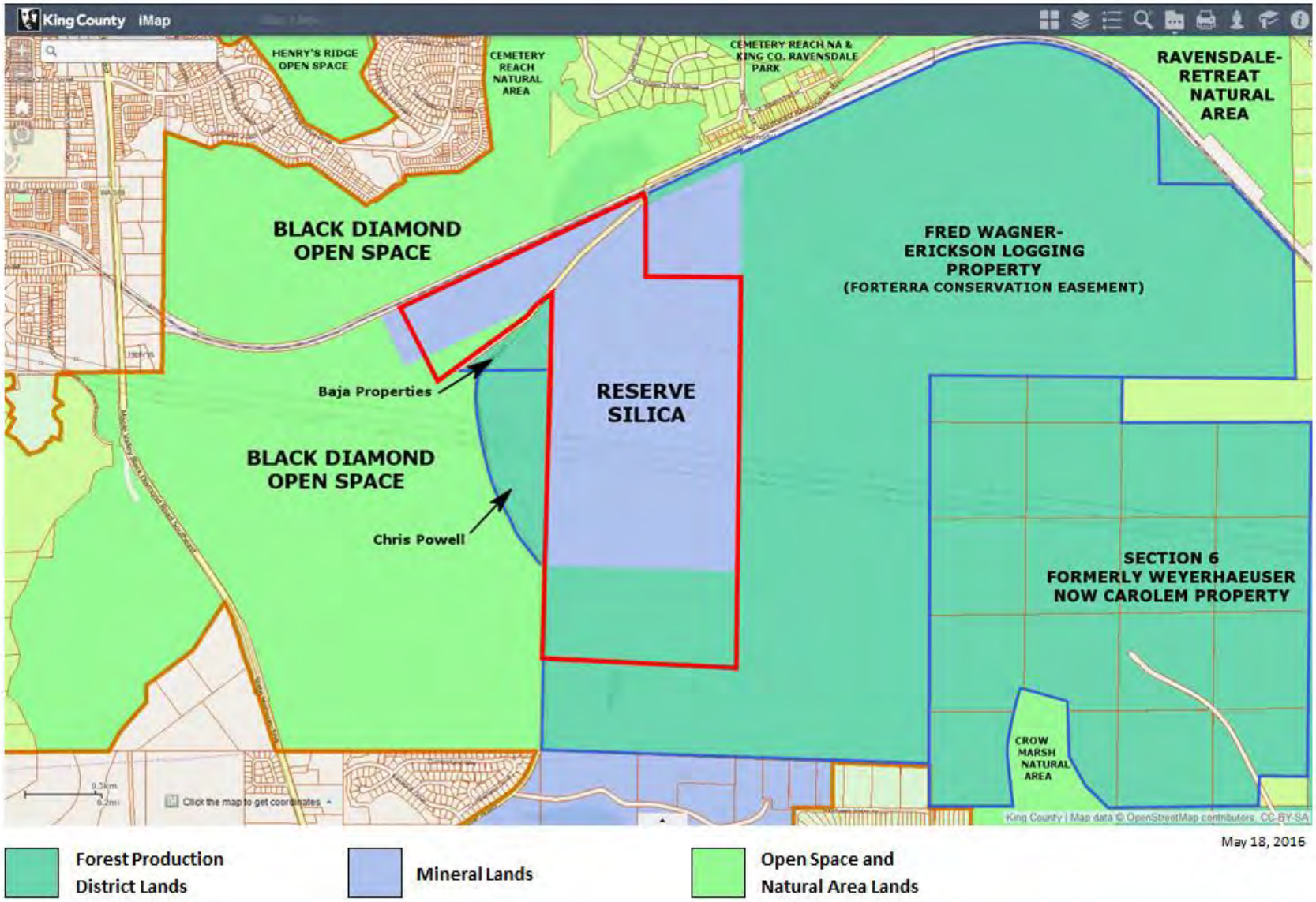
This November 1995 zoning map, included in the City of Kent Wellhead Protection study, indicates the entire Reserve Silica property, aside from the processing plant and clay settling ponds, was zoned Forestry and was part of the original FPD.



Source: City of Kent Wellhead Protection Program, April 2, 1996.

Figure 4.2b Surrounding Land Uses

Reserve Silica property is entirely surrounded by Forest Production District Lands and King County Open Space lands.



4.3 Would Upzoning Reserve's Property to Rural Residential Set a Precedent for Other Disadvantaged Natural Resource Lands?

Reserve claims upzoning this property would not set a precedent to upzone other resource-zoned lands,[1] pointing out that the FPD lands owned by Wagner/Erickson to the northeast, east and south of Reserve are protected by a Conservation Easement owned by Forterra which does not allow any permanent structures to be built on the property. As such, this adjacent ownership would not be in a position to upzone their property from Forestry.

We agree with this conclusion as it relates to the Wagner/Erickson forestlands. However, we are aware of three mining sites within the 32 square mile Rock Creek Valley that would be highly likely to follow through with an upzone request should a precedent be set with Reserve.[2] The Middle Green River Coalition also has identified three mining sites in their area that they expect would file for an upzone under this precedent.[3] And the Rural Forest Commission identified another mining site near North Bend that they expect would file for an upzone if the precedent were set.[4] In addition, there are over 8,500 acres of former Plum Creek lands within the FPD just east of Black Diamond that Plum Creek segmented into 20 acre parcels in the 1990s prior to selling these lands. As such, these lands no longer satisfy the 80-acre minimum lot size for Forestry zoned lands.[5] Weyerhaeuser followed a similar course on some of their King County lands prior to selling.[6] Many of these have now been purchased by owners with an objective to hold the lands for development.[7] With a precedent set for upzoning Mining lands to Rural Residential (rather than reverting to the underlying Forest zoning), once the minerals are depleted or the mining is no longer profitable, it is highly likely that some of these former industrial forestland owners would apply the same logic to apply for an upzone, claiming their lands no longer qualify as FPD lands.

In summary, ***it is highly likely that other mining and forestry Natural Resource zoned property owners would apply for upzoning to Rural Residential if the precedent were set by Reserve***. We strongly believe that King County should absolutely NOT set a precedent for upzoning Natural Resource lands to Rural Residential, as it could easily open a floodgate of other upzone applications that would seriously threaten the viability of many of the County's remaining Natural Resource lands.

4.4 Conclusions: Compatibility with I-203 and King County Policy and Goals

Reserve's current proposal does <u>not</u> meet any of the five criteria specified in I-203 to qualify as a mining site conversion Demonstration Project. Their assessment of the residential use option for the property is seriously lacking, ignoring both the substantial risk to human health for the future residents from both known and unknown toxins on the site, and the substantial environmental risk the proposed development would pose to on-going efforts to try to control toxic contamination of soil, surface and ground water from Cement Kiln Dust. To approve Reserve's Demonstration Project proposal would violate at least 20 existing, long-standing King County policies, as well the Greater Maple Valley/Cedar River CSA sub-area plan. Such approval would also set a dangerous precedent which could ultimately prove devastating to the County's efforts to preserve its precious Natural Resource lands.

5.0 What Other Major Issues are Associated with Reserve Silica's Current Proposal?

Besides the numerous critical flaws with Reserve's proposal as enumerated above, there are other additional issues with the proposal that any reviewer should carefully consider. Among these are:

5.1 What Liabilities and Obligations Would King County Be Accepting Under This Proposal?

Under Reserve's current proposal, Reserve would continue to hold title to the property[1] and the County would have ownership of a Conservation Easement covering all but the 54 acres actually occupied by the proposed 72 lots. This 323 acres is known as the "Easement Area," and is comprised of "*forest, open space, wetlands, grasslands, and reclamation areas*" – collectively known as the "Conservation Values."[2] By accepting this Conservation Easement, King County is agreeing "*to preserve and protect in perpetuity the Conservation Values*."[3] Note that the Conservation Values include the capped CKD pits, the uncapped remediation area (with the still uncontrolled CKD-contaminated surface and ground water), the recently filled mine pits undergoing reclamation, the old coal tailings pile, the plant site and clay settling ponds, the buffer strips between housing clusters, etc. It should be noted that Reserve offered to donate a Conservation Easement to 300 acres of this land to Forterra Land Trust in 2012, and Forterra declined.[4]

It is unclear in Reserve's proposal just what role King County would play in 'preserving and protecting' the Conservation Values. The Homeowner Association is charged with responsibility for managing both the 'managed forest' and the Holcim Agreement and Easement (on the capped CKD pits and the mitigation area).[5,6] It is also not spelled out who would have responsibility for funding these management activities. And while the HOA is charged with managing the Holcim agreements, Reserve retains the right to do "*reclamation and closure activities related to past mining activities.*"[7] And while the HOA is charged with managing the forest lands, Reserve "*reserves the mineral, water, carbon and resource* [timber] *rights to the property*."[8] So the HOA manages (and funds?) the forest reclamation, but Reserve retains the harvest rights[9] and the rights to any carbon sequestration credits attributable to the forest.

The proposed "Open Space" lands in these Conservation Values should also be carefully considered. The 57 acres Reserve has defined as Open Space lands are comprised of (a) 20 acres of capped, fenced, CKD pits under permanent easement to Holcim,[10,11] with absolutely NO use allowed other than Hazardous Waste containment, and extremely restrictive management requirements that require the site to be perpetually in mowed grass to avoid potential shrub/tree penetration of the clay cap protecting the underlying CKD hazardous waste;[12,13] (b) 20 acres of BPA powerline easement, segmented into three pieces by capped and fenced CKD pits;[14,15] and (c) 17 acres of buffer strips between the 9 clusters of houses (average width <150').[16] Obviously, this isn't your typical "open space" lands. Reserve blatantly claims these 57 acres will provide recreational opportunities for the residents ("*Managed Open Space*

area of 57 Acres to provide recreational opportunities for the residents on the property with the potential of an equestrian facility.")[17]

The County Exec's staff comments in 2012 to this proposal are telling. "*It would be inappropriate to accept such restricted and compromised areas as open space.*" "*Neither a future homeowner association nor the County Parks Division should be saddled with unmanaged open space that needs a high level of restoration.*" "*It would be an expensive mistake for the County to accept these disturbed areas as open space.*"[18]

Obviously, the 57-acres of Open Space Reserve is proposing does NOT qualify as open space by County standards, and has NO place within the County DNRP portfolio. The same goes for the ~20-acre Holcim remediation area, where the majority of the highly contaminated and toxic leachate, surface and groundwater is still uncontrolled, and has migrated off-site, in spite of over fourteen years of efforts at trying to control this source of contamination.

The above observations relate to the 323-acre "Easement Area." The remaining 54 acres of developed lots is presumably covered by the Covenants, Conditions and Restrictions (CCR's) proposed by Reserve in Appendix C of their May 1, 2016 proposal. However, the area covered by CCR's is not specifically defined in the May 1, 2016 proposal (Exhibit A defining "The Property" has been left blank).[19] Reserve retains the right to modify any of the CCR's at their discretion at any time during the development period (up to the next 20 years).[20] Reserve also retains the right to define 'Common Areas' within the area covered by CCR's. 'Common Areas' can include "*roads, trails or other access ways, parks, sensitive area tracts or open spaces designated by Declarant* [Reserve] ….. *streams, storm water control facilities, …. drainage easements or facilities, … easements or other areas of facilities designated by Declarant herein or in other recorded documents …..*"[21] 'Common Areas' designated by Reserve will be deeded to King County,[22] and lot owners will have a non-exclusive easement to these 'Common Areas'.[23] The HOA will be charged with managing and maintaining the 'Common Areas',[24] apparently at their expense.[25]

These CCR provisions give Reserve pretty much complete control on defining what lands will be deeded to King County as 'Common Areas', as well as modifying the CCR's as they see fit. Provided the area covered by CCR's (i.e., [the blank] Exhibit A of Appendix C) clearly specifies that "The Property" only covers the 54 acres of developed lots, this may not be a major issue for the County. If however, Exhibit A were to include any of the remaining 323 acres, such as the capped CKD pits (declared 'open space' by Reserve) or the uncapped mitigation area (declared 'forest' by Reserve), then the proposed CCR provisions could pose major risks and liabilities to the County.

The Development Agreement; Conservation Easement; and Covenants, Conditions and Restrictions proposed by Reserve can collectively shift substantial responsibility and liability for this property from Reserve to the future Homeowner Association and to King County, while largely retaining Reserve's ability to extract additional value from the property through future timber harvest and lot sales. The County should VERY carefully review and revise these documents if ever considering approval of this proposal.

5.2 Is It Practical for the HOA to Manage the Forest Reclamation and Holcim Agreements?

Reserve's proposal calls for the Homeowner Association to manage the restoration and operation of the proposed 211-acre 'managed forest' and also to manage the Holcim CKD waste agreement and easements.[1,2,3] It is totally impractical to expect a HOA to be able to effectively perform either of these highly technical and complex functions, nor to fund these management functions. Reserve should NOT be allowed to skip out from their responsibility for either of these reclamation and cleanup obligations.

5.3 Does the Proposal Really Enhance Public Recreational Opportunities?

While Reserve touts the increased recreational opportunities of their proposal ("*The County recognizes the public benefits that will accrue from this Development Agreement, including ….. increased and enhanced equestrian recreational opportunities.*"[1] and "*The project will enhance such* [existing recreational] *opportunities.*[2]), it should be noted that no access rights to the general public will be provided to any portion of the property.[3] As such, any recreational benefits will accrue solely to the residents of the Reserve development. Hardly a "public" benefit. It's also worth noting that all references to the equestrian facilities are couched as 'possible' or 'potential' - Reserve retains sole authority to decide whether such facilities are built or not.

5.4 Does the Community Support This Proposal?

There has already been extensive opposition expressed to Reserve Silica's Demonstration Project proposal and to Demonstration Projects in general. Letters of opposition have already been submitted by the County Exec and his staff (Exec's proposed draft of 2016 Comp Plan), the Rural Forest Commission,[1] the Greater Maple Valley Unincorporated Area Council,[2] Friends of Rock Creek Valley,[3] the Middle Green River Coalition,[4] and the City of Black Diamond.[5] Expressions of concern regarding installation of a 72-unit development on the property have been voiced by Washington Department of Ecology-Water Quality program,[6] and numerous Ravensdale-area residents.

5.5 Should Policy I-203 be Extended in the 2016 KCCP to Allow Reserve to Submit Their Current Proposal?

Reserve Silica has had nearly four years since adoption of the I-203 demonstration project amendment to submit a proposal, and have not done so. When Reserve's efforts to purchase the development rights from the TDR sending site (Sec 6, T21N,R07E) originally envisioned with the passage of the I-203 Amendment failed, they chose, in June 2014, to purchase the 147-acre Black Diamond tract as an alternative sending site – over two years ago. On June 30, 2015, they stated their intention to submit a proposal to the King County Council and Exec "in the next week or two,"[1] but failed to do so. They did finally submit a 12-page summary of their current proposal to the KC Council Committee of the Whole meeting on April 6, 2016. And they completed their full 273-page proposal document (dated May 1, 2016) and indicated on May 27 that delivery of this full document to the County was imminent.[2] Still,

three months later, there has been no submission. As such, we believe Reserve has already had ample opportunity to submit a Demonstration Project proposal, but has failed to do so. There is still a four-month window for Reserve to submit a proposal before the 2016 KCCP is adopted.

Even if the mining site conversion provision of I-203 were extended, the major issues with the May 1, 2016 proposal (the known and unknown contaminates on the site; the yet to be determined clean-up requirements; the health risks to future residents and the potential liability to King County in approving this development; the failure of the proposal to meet the qualifications of the I-203 policy; and the numerous County Codes such a project would violate – to mention just a few) would make it highly unlikely that any Demonstration Project would be approved for this site for years to come, if at all. Thus, any extension of the I-203 policy would only serve to create a state of limbo during which it is likely little more will be done to complete reclamation and substantial restoration of the property to its pre-mining state.

6.0 WHO IS RESERVE SILICA / RESERVE INDUSTRIES?

Reserve Silica Corporation is part of a complex network of past and present corporations managed by the Melfi Brothers, Frank, William and James, through the parent company, Reserve Industries Corporation, headquartered in Albuquerque, New Mexico. The Melfi Brothers have been directly responsible for the management of the companies of Reserve Industries since 1985 when they assumed leadership of the company from their father, James Melfi, Sr. Likewise, the history of operators and activities on the Ravensdale site is long and varied. The following biographical sketches of the major companies managing the Ravensdale site are provided in an attempt to make sense of the history of the Ravensdale site and the major players in that history.

6.1 Who is Reserve Industries Corporation?

Reserve Industries Corporation was formed in 1957 under the name, Reserve Oil & Minerals Corporation.[1] In 1962, James J. Melfi Sr. took control of the company.[2] James Melfi Sr. retired as Chairman of the Board in 1985, at which time his three sons, James, Frank, and William, assumed leadership of the company. Current principals of Reserve Industries are listed as:

- Frank C. Melfi, Director, President, Chief Executive Officer;
- William J. Melfi, Director, Vice President for Finance and Administration; and
- James J. Melfi Jr, Director, Chairman of the Board.[3,4]

Location of Reserve Industries headquarters, Albuquerque, New Mexico.

Reserve Oil & Minerals changed its name to Reserve Industries Corporation in 1987.[5,6,7] Prior to August 1992, Reserve Industries was listed on the NASDAQ National Over-the-Counter Market, but following 10 years (1992-2002) during which the corporate financial statements were not independently audited, the company ceased filing of financial information with the Securities & Exchange Commission, and is no longer a publically traded corporation.[8]

From its beginnings in uranium exploration, mining and processing in New Mexico, Reserve Industries grew into a multi-national corporation with global interests in mineral exploration, extraction and processing, and industrial waste processing. Through numerous subsidiary companies, joint ventures and equity interests, Reserve Industries has, at various times in its history, been connected to operations in multiple locations in the U.S. and Canada, as well as in the Philippines, Singapore, Japan, Slovakia, Belgium, and China[9] – and possibly other locations as well for which records have not yet come to light. Reserve Industries connections to Washington State go back to as early as 1977 when they were exploring for uranium in Pend Oreille County.[10] Since the purchase of the assets of Industrial Mineral Products in March 1986, Reserve has had a major presence in Washington State through its wholly owned subsidiaries, L-Bar Products, Inc., Reserve Silica Corporation, and now Reserve Properties, LLC.

The following is a partial list of subsidiary companies, joint ventures and equity interests (past and present) of Reserve Industries:[11,12,13,14,15]

Wholly owned subsidiaries and/or affiliated corporations:

- Reserve Silica Corporation (silica sand mining)
- Reserve Properties, LLC (holder of Black Diamond Sec. 24 property)
- Reserve Minerals Corporation
- Reserve Abrasives Ltd., Inc.
- Reserve Rossborough Corporation (products for steel manuf.)
- Reserve Rossborough Ventures Corp (products for steel manuf.)
- Reserve Trigon Corporation
- Rossborough-Remacor LLC
- Reserve Trisal, Inc.
- Industrial Mineral Products (Philippines), Inc.
- Melfi Corporation
- L-Bar Products, Inc.
- L-Bar Minerals Corporation
- L-Bar Canada, Inc.
- L-Bar Ag Products, Inc.
- L-Bar – Rossborough
- L-Bar Grinding Corporation
- McCoy Mining Corporation
- Embro Corporation

Joint ventures and/or shared operations:

L-Bar Minerals [Reserve Oil & Minerals] and Standard Oil of Ohio [SOHIO] (L-Bar Ranch, New Mexico: uranium mining and processing)
Reserve Industries and AMAX Exploration, Inc. and AMAX Gold Inc. (gold exploration in Nevada)
Waterbury Lake Joint Venture, Cigar Lake Deposit, Saskatchewan, Canada (uranium)
Dawn Lake Joint Venture, Saskatchewan, Canada (uranium)
McArthur River Joint Venture, Saskatchewan, Canada (uranium)
L-Bar Grinding and LaPorte Metal Processing Company
Reserve Industries and Rossborough Corp (steel manufacturing products)
Reserve Oil & Minerals and Phelps Dodge Corporation (uranium)
McCoy Mining and Newmont Mining Corp (uranium)
Reserve Oil & Mineral and Western Nuclear Corp and Goldfield Corp (uranium)
Other joint mineral exploration ventures in California, Arizona, Colorado and Washington

Equity interests:

Rossborough Manufacturing Company (products and services to the steel and foundry industries)
Rossborough Manufacturing Co. L.P. (products and services to the steel and foundry industries)
JPL Industries Pte. Ltd., Singapore (industrial waste processing)

6.2 Who is Reserve Silica Corporation?

Mined sandstone to be processed. (Gene Criss, 2007, myspace.com)

Reserve Silica Corporation is a wholly owned subsidiary of Reserve Industries Corporation of Albuquerque, New Mexico. Reserve Silica is a Washington corporation, formed July 1990. Corporate officers are listed as Frank Melfi, President; William Melfi, Vice President/Secretary/ Treasurer; James Melfi, Chairman.[1]

Reserve Silica assumed the silica sand mining lease for the Ravensdale site from its sister company, L-Bar Products, Inc., probably in 1990 (or possibly 1991, but in any case, before

L-Bar Products closed its embattled Chewelah, Washington magnesium processing plant and filed for bankruptcy in 1992).[2,3] L-Bar Products was a wholly owned subsidiary of Reserve Industries,[4] and operated the Ravensdale site from March 1986 until transferring the silica sand mining lease to Reserve Silica. After assuming this lease from L-Bar, Reserve Silica continued the strip mining and processing of silica sand for use in cement and glass manufacturing, golf course bunker sand, and plant nurseries. Reserve Silica finally purchased the property from Glacier Park Co. (subsidiary of Plum Creek Timber Co.) in 1997.[5] Reserve Silica extracted hundreds of thousands of tons of sandstone/silica sand material from the site before the completion of active strip mining operations in December 2007.[6] Since 2007, Reserve Silica has been selling off the stockpiled silica sand, which is now virtually depleted. In 2007 Reserve Silica began backfilling in earnest the huge depleted mining pits on the site[7] with materials excavated from various construction sites and projects around the region. Reserve Silica anticipates backfilling of the mining pits will be completed by the end of 2016,[8] undoubtedly due in part to the approval just received in February[9] for the disposal of concrete from the old SR 520 Evergreen Point Floating Bridge at the Ravensdale site.


Mining activities. (Gene Criss, 2007, myspace.com)

Development Proposals for the Ravensdale Site

As the Reserve Silica site in Ravensdale nears the end of its life as an active mining and fill site, King County Codes would say that this site should revert to a Forest zoning, compatible with the surrounding zoning and land use, and in accordance with its Forest zoning[10,11,12] prior to its purchase by Reserve Silica in 1997. However, in 2011, Reserve Silica submitted a proposal to the King County Council requesting to up-zone a portion of the site from mining classification to RA-10 rural residential, with a plan to create a 32-unit housing development on the site.[13] When this plan met with resistance from the King County Exec's Office, which recommended the property be returned to Forest zoning, Reserve submitted a revised proposal in 2012 to up-zone the entire site and now create a 40-unit housing development.[14] Ultimately, a compromise amendment, I-203, was approved by the Council as part of the 2012 Comp Plan allowing Reserve Silica to submit a proposal for a Demonstration Project involving transfer of development credits from lands in the vicinity that form the headwaters of critical, high valued habitat area, or that remove the development potential from nonconforming legal parcels in the forest production district, or that provide linkages with other forest production district lands.[15] The intent of this compromise was to transfer the 18 development credits from nonconforming legal parcels in the nearby (1/2 mile away) Section 6 (Twp21N, Rng07E) property in the Forest Production District (FPD) formerly belonging to Weyerhaeuser Company that is the headwaters of both Rock Creek (Cedar, WIRA 8) and Thirty-one Man Creek (Green/Duwamish, WIRA 9), thus permanently protecting this 638 acre property located in the FPD at the heart of Ravensdale Ridge.[16]


Mining activities. (Gene Criss, 2007, myspace.com)

When attempts by Reserve Silica to acquire these development credits from the current property owner were unsuccessful,[17] Reserve Silica chose, instead, to purchase a 141-acre property[18] zoned RA-5 in Section 24 (Twp21N, Rng06E) adjacent to the south side of the City of Black Diamond (2 ¼ miles away) as a TDR sending site.[19] This property was purchased by Reserve Silica in June 2014.[20] In March 2016, Reserve Silica transferred ownership of this Black Diamond property to a newly created wholly owned subsidiary of Reserve Industries, Reserve Properties, LLC.[21] This new sister company to Reserve Silica was just formed in February 2016.[22]


Fill material dumped over rim of mining pit.
(reservesilica.com)

Reserve Silica has now come forward with a proposal to create a 72-unit housing development on the Ravensdale site consisting of 9 clusters of 8 homes each, located on two portions of the property. Two variations of this TDR/up-zone proposal have been suggested. In brief, these proposals are:

1.) Upzone the Ravensdale site to RA-10; transfer 25 of the available 28 development credits from its Black Diamond Section 24 property to the Ravensdale site (a rural-to-rural transfer); purchase 9 TDRs from the King County TDR bank; build a 72-unit housing development at Ravensdale; place 126 acres of Section 24 under conservation easement, and sell remaining three 5-acre parcels on Section 24 for residential development.[23]


Reserve Silica sand processing plant adjacent to Ravensdale Lake, 2016

2.) Donate 25 of the available 28 development credits from the Black Diamond Section 24 property to the King County TDR bank; up-zone the Ravensdale site to RA-5; build a 72-unit housing development at Ravensdale; (presumably) sell or donate the three extra development credits from the Ravensdale site to the King County TDR bank; place 126 acres of Section 24 under conservation easement, and sell remaining three 5-acre parcels on Section 24 for residential development.[24]

Environmental and Hazardous Waste Concerns at the Ravensdale Site

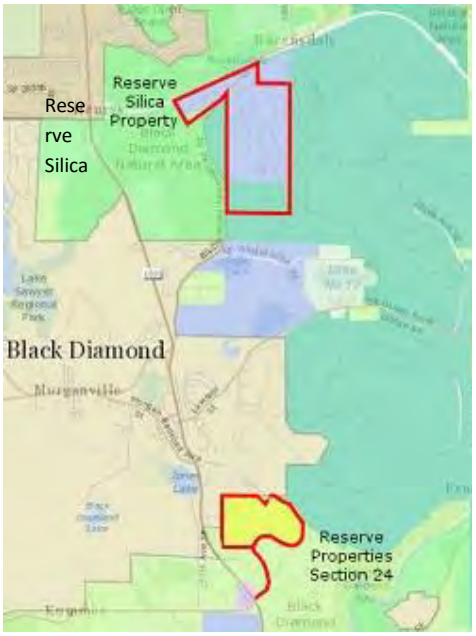
There are a number of major environmental and hazardous waste concerns at the Reserve Silica Ravensdale site. These are covered in detail in the "Environmental Risks and Human Health Hazards" section of this document, but the Washington State Department of Ecology (WDOE) hazard ranking of this site as a class 1 priority (highest ranking possible) MTCA clean-up site for its potential threat to human health and/or the environment relative to all other Washington State hazardous sites [25] is evidence of the seriousness of these concerns –


Portion of Reserve Silica Ravensdale fill site.
(reservesilica.com)

especially considering that this ranking was based solely on an assessment of leachate from a single hazardous material (cement kiln dust) known to have been dumped in two specific areas of the site (Lower Disposal Area and Dale Strip Pit). A full site assessment beyond the known CKD disposal areas has not been conducted despite the fact that the property was listed as a landfill until December 1999;[26] has groundwater, soil and surface water contamination by metals and corrosive waste;[27] has had numerous permit violations[28] and citizen complaints;[29] and even WDOE's own statement that other mine pits on the site were filled with unknown materials.[30] Consequently, the full extent of hazardous waste dumping and toxins on the site is presently unknown and needs further study.

6.3 Who is Reserve Properties, LLC?

Reserve Properties, LLC is a wholly owned subsidiary of Reserve Industries Corporation, and sister company to Reserve Silica Corporation. Reserve Properties was formed February 19, 2016. Incorporation papers filed with the Washington Secretary of State list Frank Melfi as Manager.[1] Frank Melfi is also President of both Reserve Industries and Reserve Silica.



Relative location of Reserve Silica Ravensdale site to Reserve Properties Section 24 TDR site. (King County Parcel Viewer)

In June 2014, Reserve Silica purchased a 141-acre property located in Section 24 (Twp21N, Rng06E) adjacent to the south city limits of the City of Black Diamond.[2] This property, formerly owned by Weyerhaeuser Company, is zoned RA-5 and has been approved for 28 residential lots. The property was logged and replanted by Weyerhaeuser in about 2012.

Reserve Silica purchased this Section 24 property as an alternative TDR sending site for their proposed 72-unit housing development on the Ravensdale silica sand site after attempts to purchase the 18 TDRs from the Forest Production District lands in Section 6 (Twp21N, Rng07E) located just ½ mile from the Ravensdale site, were unsuccessful.

On March 14, 2016, just a month after forming Reserve Properties, LLC, Reserve Silica transferred ownership of the Black Diamond Section 24 property to Reserve Properties,[3] so this property is no longer an asset of the Reserve Silica subsidiary of Reserve Industries Corporation.

6.4 Who was L-Bar Products, Inc.?

L-Bar Products, Inc. was a wholly owned subsidiary of Reserve Industries Corporation.[1] L-Bar Products became the owner of the assets of Industrial Mineral Products, Inc. of Ravensdale (IMP) when Reserve Industries purchased those assets in March 1986.[2] At the time of its incorporation, it appears L-Bar

Products maintained the continuity of operations from IMP, retaining Victor J. Hoffman as President [3,4] and Ronald J. Roman as Vice President.[5] However, these executive roles changed at some point as Frank C. Melfi and brother William J. Melfi are later named as the executive officers of L-Bar Products,[6] Frank Melfi, President.[7]

Among the IMP assets acquired by L-Bar in 1986 was the mining lease for the Ravensdale silica sand site and a magnesium recovery plant in Chewelah, Washington[8] (formerly operated by Phoenix Resources Recovery, a wholly owned subsidiary of IMP[9,10]). See detailed write-up, Who Was Industrial Mineral Products, Inc.

Ravensdale Site

L-Bar operated the Ravensdale Site from 1986 until ca. 1990 when the lease was apparently transferred to L-Bar's sister company, Reserve Silica Corporation (formed in July 1990 as another wholly owned subsidiary of Reserve Industries [11,12]). L-Bar mined, washed, screened and dried silica sand from the site. This sand was sold for cement and glass manufacturing and fiberglass.[13,14,15] L-Bar Products also continued using portions of the site for the disposal of cement kiln dust from the Ideal Cement plant in Seattle [>Holnam>Holcim].[16] This dumping of cement kiln dust, begun in 1979 by IMP, continued under L-Bar's (Reserve Industries) management from 1986 to 1989.[17]

Chewelah Site

L-Bar Products operated the Chewelah magnesium recovery plant from 1986 until closing the plant in 1991.[18,19] The plant purchased and processed industrial waste in the form of magnesium flux bars from the nearby Northwest Alloys (NWA) magnesium smelter, recovering magnesium granules from the waste for use in steel manufacturing,[20] and creating a powdery material called flux bar residue. L-Bar stockpiled both flux bar and flux bar residue on the Chewelah site.[21] During its tenure, L-Bar was cited numerous times for improper hazardous waste handling and for violation of air, water quality, and dangerous waste regulations.[22,23] L-Bar was cited for violations by both the Washington Department of Ecology (WDOE) and the U.S. Environmental Protection Agency (USEPA), including a civil suit filed by the WDOE in 1988.[24,25]

Current view of L-Bar Products Chewelah magnesium recovery site on Hwy 395 south of Chewelah. Colville River at upper right. (Google Earth)

Criminal charges were filed by the USEPA against L-Bar Products, Inc. and two of its plant managers in 1995 under a federal grand jury indictment for illegally burying barrels containing hazardous sulfuric acid wastes on the site in 1990.[26,27] The charges included *"two counts of conspiracy to unlawfully store and dispose of hazardous waste, one count of unlawful disposal of hazardous waste, one count of unlawful storage of hazardous waste, one count of unlawful release of hazardous waste and three counts of making a false statement to a government agency"*[28] While *"L-Bar president Frank Melfi, reached at the Albuquerque, N.M., office of L-Bar's parent company, Reserve Industries Inc., said he hadn't seen the indictment and declined to comment,"*[29,30] then State Attorney General Christine Gregoire was quoted as saying, "*I want to emphasize that these criminal charges are not the result of a business inadvertently*

doing the wrong thing. Our investigation revealed that L-Bar officials decided to illegally dump the chemicals after exploring proper disposal options." And, "*While most businesses work to comply with environmental laws, L-Bar tried to cut its operating costs by thousands of dollars by burying wastes out on the back forty.*"[31,32] Ultimately, the plant managers pled guilty and received probation for their roles in this, but charges against L-Bar/Reserve Industries were dismissed after the case did not come to trial in a timely manner while the prosecutors were focused on bankruptcy claims against L-Bar.[33,34,35]

In addition to selling the recovered magnesium granules to the steel industry, L-Bar Products also sold the hazardous magnesium flux bar residue, a byproduct from its magnesium recovery process, as agricultural fertilizer[36] and road deicer.[37,38] The same material was sold for both uses – the fertilizer under the brand names Cal Mag, Ag Mag, and Al Mag, and the deicer as Road Clear.[39] This was done legally by labeling the hazardous material as a "product," thus exempting it from hazardous waste regulations.[40,41,42] Concerns regarding the fertilizer's safety were raised,[43] and crop failures were attributed to the use of the fertilizer.[44] An analysis of the product characterized it as volatile, unpredictable, unsafe, and potentially poisonous to farmlands; and that advertising materials were "designed to deceive."[45,46,47]

L-Bar closed the Chewelah plant without notice in December 1991.[48] The reason reported at the time was that L-Bar's only customer for their recovered magnesium granules stopped payment on a $900,000 contract, thus leaving the company with no operating funds.[49] Records indicate that the company stopping payment, Rossborough Manufacturing, was 50% owned by Reserve Industries, L-Bar's own parent company.[50,51,52] By July 1992, L-Bar declared Chapter 11 bankruptcy, and in March 1995 entered Chapter 7 bankruptcy.[53] At the time of closing, an estimated 100,000+ tons of hazardous flux bar and flux bar residue wastes from the magnesium recovery operation were stockpiled on the site.[54,55,56] The company was also facing fines and costly remedial actions stemming from the 1988 civil suit brought by WDOE and from a 1989 violation of state hazardous waste regulations.[57,58] (The USEPA criminal case had not yet been filed as the matter of the illegally buried sulfuric acid barrels had not yet come to light at the time of the plant closure.)

Following closure of the plant, WDOE continued to hold L-Bar Products and its parent company, Reserve Industries, liable for cleanup of the site as the owner and operator of the magnesium recovery plant; and it also held NWA (a subsidiary of Alcoa) liable as the original producer of the magnesium flux bar material. It was determined that magnesium flux bar processing at the site had caused soil, groundwater, and surface water contamination.[59] It was also found that toxins from the site were entering the nearby Colville River.[60,61,62]

Reserve Industries claimed it was not liable for the contamination at the L-Bar site stating that L-Bar Products was a separate entity from Reserve Industries,[63] albeit their wholly owned subsidiary. Ultimately, Reserve Industries was party to the L-Bar bankruptcy settlement reached in 1999, under which NWA assumed responsibility for site cleanup, with a cost estimate of $10 million (NWA had already voluntarily begun cleanup of the site five years prior to the bankruptcy settlement).[64,65] In addition, NWA assumed the responsibility for paying the 56 employees who had not received their final

wages from L-Bar Products when the plant closed in 1991.[66,67] In turn, title to the Chewelah plant site was turned over to NWA as settlement of NWA's claims against L-Bar Products.[68] NWA had already voluntarily cleaned up the hazardous fertilizer/road deicer left in seven warehouses in Eastern Washington and the Willamette Valley when L-Bar broke the warehouse leases and abandoned the material as a "burdensome asset."[69]

As of 2002, NWA had completed removal of the flux bar and flux bar residue stockpiled at the site and the site is now subject to compliance monitoring under WDOE oversight to detect any worsening levels of surface or ground water contamination that would necessitate further cleanup of the site.[70] The site is also under a restrictive easement limiting future land use to industrial or commercial purposes, with one portion limited to agricultural use, provided such uses do not cause further contaminant release.[71]

6.5 Who was Industrial Mineral Products, Inc.?

Industrial Mineral Products, Inc. (IMP) was a corporation headquartered in Ravensdale, Washington involved in mining and industrial waste processing. Principals of IMP included Victor J. Hoffman, President; Ronald J. Roman, Vice President; and Arthur B. "Bud" Berg, Manager.[1,2,3,4] IMP acquired the mining lease for the Ravensdale silica sand site in 1972.[5] IMP operated the Ravensdale site from 1972 to March 1986, at which time IMP sold its assets to L-Bar Products, Inc., a wholly owned subsidiary of Reserve Industries Corporation of Albuquerque, New Mexico (and sister company to Reserve Silica).[6]

Trademark registered 1982 by Industrial Mineral Products, Inc., Ravensdale, Washington.

Ravensdale Connection

IMP mined silica sand from the Ravensdale site under lease from Burlington Northern Timberlands (predecessor to Plum Creek Timberlands) from 1972 to 1986. Silica sand was processed at the Ravensdale site and sold primarily for concrete and glass manufacturing. IMP had an arrangement with Ideal Cement Company (Holnam>Holcim) located on the Duwamish Waterway in Seattle whereby IMP sold silica sand (and ASARCO slag) to Ideal Cement and Ideal Cement in turn disposed of their cement kiln dust (CKD) at two locations on the Ravensdale site.[7] Those locations are now known as the Lower Disposal Area [LDA] and Dale Strip Pit [DSP]. Dumping of CKD occurred from 1979 until 1986[8] when IMP's assets were purchased by L-Bar Products, Inc., a wholly owned subsidiary of Reserve Industries. Following the purchase, L-Bar Products continued the sale of silica sand to Ideal Cement and the dumping of CKD on the Ravensdale site until 1989.[9]

ASARCO Connection

From its Ravensdale headquarters, IMP operated a number of businesses and subsidiary companies, both in the United States and overseas. One of these businesses, operated through IMP's subsidiary, Black Knight, Inc., had an exclusive contract to purchase copper slag from the ASARCO smelter in

Tacoma.[10] IMP processed this slag and sold it for a wide range of purposes including feedstock for cement manufacturing, road ballast, driveway gravel, fill material, and decorative rock.[11,12,13] These products were sold throughout the region, but one of the most noted uses of IMP's copper slag products was as road ballast in the log sort yards around the Port of Tacoma.[14] It was found that the copper slag, when mixed with the organic materials in the wood debris in the sort yards, leached heavy amounts of arsenic and other toxic materials.[15] In the lawsuits and countersuits determining liability for cleanup of the Port areas, IMP was sued as a potentially liable party by ASARCO after ASARCO was sued as liable for the cleanup at the Louisiana-Pacific log sort yard. However, the courts determined that the suit brought against IMP by ASARCO was filed too late after the company's disincorporation, leading to the dismissal of charges against IMP. The delay in filing charges against IMP was due to ASARCO's belief that L-Bar Products, Inc. (Reserve Industries), having purchased the assets of IMP, was the successor in liability to IMP. ASARCO thus initially filed their suit against L-Bar Products, but the courts ruled that L-Bar could not be proved as successor in liability under CERCLA rules. (CERCLA – the Comprehensive Environmental Response, Compensation, and Liability Act - was relatively new and largely untested in the courts at that time.) Ultimately, neither IMP nor L-Bar were held financially liable for cleanup of ASARCO slag distributed by IMP.[16]

It has been stated that ASARCO slag found its way to the Ravensdale site. Though documented proof seems to have been lost, it is highly probable that IMP would have utilized their own road ballast and gravel products on their own roads at the Ravensdale mine site since they were selling these products to other industrial operators for that purpose. In a 1983 visit to the Ravensdale site, Greg Wingard states in his trip report having picked up two pieces of copper slag from a road on the Ravensdale site.[17] He reports submitting this sample to the Washington Department of Ecology (WDOE), but results of any testing done by WDOE could not be found during a 2013 Public Records request.[18] However, Mr. Wingard recalls the samples were sent to WDOE's Manchester Laboratory which confirmed the samples were very high in arsenic and that the slag was from ASARCO.[19] A former worker on the Ravensdale site also reported in 2004 having been told by older workers at the site that ASARCO slag was dumped on the site, along with oil from heavy equipment, but no apparent follow-up of this report has been found in WDOE records either.[20]

Chewelah Connection

Another business run by IMP was a magnesium recovery plant in Chewelah, Washington. This business was operated by IMP's subsidiary, Phoenix Resources Recovery (PRR).[21,22,23] The plant area, now commonly referred to as the L-Bar Site after it was purchased in 1986 by Reserve Industries through its subsidiary, L-Bar Products, Inc., has been the focus of numerous environmental complaints, first against PRR and then against L-Bar Products.[24,25] The magnesium recovery process involved grinding flux bars (the waste product from the Northwest Alloys [Alcoa subsidiary] magnesium smelting plant in Addy, Washington. The ground material was sifted to remove magnesium granules, which were sold for use in steel manufacturing.[26] The fine powdery residue of this grinding process, called flux bar residue (FBR), was stockpiled on the site and later marketed as both an agricultural fertilizer and a road deicer (same material).[27] PRR initially announced plans to market the FBR as fertilizer,[28,29] but it was after purchase of the plant by Reserve Industries/L-Bar Products that the marketing of fertilizer and road deicer

apparently began in earnest. (Ronald J. Roman, Vice President of PRR and then L-Bar Products, received a patent for the road deicer formula "Road Clear" in 1987, noting in the patent application that this could be used as agricultural fertilizer as well. This patent was assigned to L-Bar Products, Inc.)[30]

Following closure of the Chewelah plant by L-Bar in 1991, the site has been the focus of a major cleanup effort by the WDOE. This cleanup effort has been managed by Northwest Alloys, which assumed responsibility for the cleanup as part of the L-Bar Products bankruptcy settlement in 1999.
IMP was dissolved in December 1986 following the sale of its assets to Reserve Industries' subsidiary L-Bar Products, Inc. in March 1986.[31,32]

NOTES AND REFERENCES

Abbreviations:

SEC – Securities and Exchange Commission
USEPA – U.S. Environmental Protection Agency
WDOE – Washington Department of Ecology

2.2 What is the Magnitude of the Likely Forest Reclamation Costs?

[1] Reserve Silica Rural Mining Site Conversion Project, May 1, 2016. Introduction, pg. 1.

[2] International Forestry Consultants, Inc. *Forestry Analysis*. Reserve Silica Response to King County's Proposed Forest Resource Classification, February 14, 2012. Appx. C.

[3] Bradley, Gordon, et al. *Reserve Silica Project Land Use Classification Evaluation.* University of Washington. March 12, 2012. Reserve Silica Response to King County's Proposed Forest Resource Classification, February 14, 2012., Appx. G.

[4] Bradley, Gordon, et al. *Reserve Silica Project Land Use Classification Evaluation.* University of Washington. March 12, 2012. Reserve Silica Response to King County's Proposed Forest Resource Classification, February 14, 2012., Appx. G, pg. 6.

[5] International Forestry Consultants, Inc. *Forestry Analysis*. Reserve Silica Response to King County's Proposed Forest Resource Classification, February 14, 2012. Appx. C. pg. 5.

[6] Reserve Silica Response to King County's Proposed Forest Resource Classification, February 14, 2012.

[7] Reitenbach, Paul: Senior Policy Analyst, DDES. Letter to KC Council TrEE Committee. July 26, 2012. Pgs. 2, 3, & 4.

[8] Rural Forest Commission. Letter to Larry Gossett, King County Council Chair. October 17, 2012.

[9] American Forest Management. *Forest Management Plan Reserve Properties*. Reserve Silica Rural Mining Site Conversion Project, May 1, 2016. Appx. I.

2.3 Assessment of Reclamation Costs

[1] International Forestry Consultants, Inc. *Forestry Analysis*. Reserve Silica Response to King County's Proposed Forest Resource Classification, February 14, 2012. Appx. C, pg. 5.

[2] Bradley, Gordon, et al. *Reserve Silica Project Land Use Classification Evaluation.* University of Washington. March 12, 2012. Reserve Silica Response to King County's Proposed Forest Resource Classification, February 14, 2012, Appx. G., pg. 6.

2.3b Forest Reclamation Assumptions

[1] Arkansas Timber Info. *Herbicide Applications.* www.arkansastimber.info

[2] International Forestry Consultants, Inc. *Forestry Analysis*. Reserve Silica Response to King County's Proposed Forest Resource Classification, February 14, 2012. Appx. C, pg. 8.

[3] Reserve Silica Corporation website, June 15, 2016. http://www.reservesilica.com/

[4] Melfi, Frank: President of Reserve Silica and Reserve Industries (parent company of Reserve Silica). Personal conversation with Michael and Donna Brathovde. May23, 2016.

[5] Transpo Group. *Draft Memorandum*. Reserve Silica Rural Mining Site Conversion Project, May 1, 2016. Appx. F.

[6] Smail, Derek. Personal communication. 2015.

[7] White, Fred: Site Development Specialist, King County DPER. Personal communication. 2015.

[8] Brathovde, Michael: Forterra Volunteer Land Steward Ravensdale Ridge. Monitoring data for Wagner/Erickson property. 2016.

[9] Reserve Silica Rural Mining Site Conversion Project, May 1, 2016. Appx. H: *Interim Reclamation Plan for the Ravensdale Quarry;* Figure 5.

[10] Vrablick, Brian J.: Forestry Project Manager, King County WTD. Email communication. June 14, 2016.
[11] Washington Department of Natural Resources. *Forest Practices Act FPAR applications, Erickson Logging*.

2.4 Estimate of Total Forestry Reclamation Cost

[1] Reserve Silica Rural Mining Site Conversion Project, May 1, 2016. Appx. H: *Interim Reclamation Plan for the Ravensdale Quarry.* Pg. 1.

2.5 Hasn't This Property Always Been Primarily a Mining Site?

[1] Reserve Silica Rural Mining Site Conversion Project, May 1, 2016. Introduction, pg. 7.
[2] Brathovde, Michael. Ravensdale History and Reserve Silica Property. Reserve Silica Rural Mining Site Conversion Project, May 1, 2016. Appx. L, pg. 2.
[3] Brathovde, Michael. Ravensdale History and Reserve Silica Property. Reserve Silica Rural Mining Site Conversion Project, May 1, 2016. Appx. L, pg. 2: Dale/Continental Coal Co processing plant.
[4] Brathovde, Michael. Ravensdale History and Reserve Silica Property. Reserve Silica Rural Mining Site Conversion Project, May 1, 2016. Appx. L, pg. 2: Dale/Continental Coal Co processing plant plus Dale strip mine.
[5] International Forestry Consultants, Inc. *Forestry Analysis*. Reserve Silica Response to King County's Proposed Forest Resource Classification, February 14, 2012. Appx. C, pg. 30. Calculation includes DSP plus LDA plus 3 active mine pits plus coal tailings plus plant site and clay tailings ponds.
[6] Brathovde, Michael. Ravensdale History and Reserve Silica Property. Reserve Silica Rural Mining Site Conversion Project, May 1, 2016. Appx. L, pg. 2.
[7] Friends of Rock Creek Valley. Rock Creek Valley Conservation Plan and Priorities. 2004.
[8] Aerial photography, 1980 and 1985.
[9] Brathovde, Michael. Ravensdale History and Reserve Silica Property. Reserve Silica Rural Mining Site Conversion Project, May 1, 2016. Appx. L, pg. 2.
[10] Brathovde, Michael. Ravensdale History and Reserve Silica Property. Reserve Silica Rural Mining Site Conversion Project, May 1, 2016. Appx. L, pg. 3.. Based on 1936 aerial photography available on King County iMap.
[11] International Forestry Consultants, Inc. *Forestry Analysis*. Reserve Silica Response to King County's Proposed Forest Resource Classification, February 14, 2012. Appx. C, pg. 4.
[12] City of Kent Wellhead Protection Program. Fig. 4-1: *Land Use Zoning and Relevant Features Map, Nov 1995.* April 2, 1996. City of Kent Wellhead Protection Program
[13] Reserve Silica Response to King County's Proposed Forest Resource Classification, February 14, 2012. Introduction, pg. 16.
[14] Rural Forest Commission. Letter to Larry Gossett, King County Council Chair. October 17, 2012.
[15] International Forestry Consultants, Inc. *Forestry Analysis*. Reserve Silica Response to King County's Proposed Forest Resource Classification, February 14, 2012. Appx. C, pg. 4.

2.6 Is Proposal Compatible with Surrounding Land Uses and Supported by Adjacent Property Owners?

[1] Reserve Silica Rural Mining Site Conversion Project. Project Summaries dated April 6, 2016 and May 1, 2016. Pgs. 1
[2] Reserve Silica Land Use Study. March 9, 2011. Pg. 16.
[3] Reserve Silica Response to King County's Proposed Forest Resource Classification, February 14, 2012. Appx. A: Carl Sanders; Appx. B: Hal Read; and Appx. E: Fred Wagner.
[4] Powell, Chris. Letter to Paul Reitenbach, 2012 KC Comp Plan Mgr. May 3, 2012.
[5] Ridley, Lisa: P&D Logging Business Administrator. Text message to Michael Brathovde, May 29, 2016.
[6] Black Diamond Natural Area, Henry's Ridge Open Space, Cemetery Reach Natural Area, Forterra conservation easement on Wagner/Erickson and Rigby properties.

[7] Powell, Chris. Letter to Paul Reitenbach, 2012 KC Comp Plan Mgr. May 3, 2012.
[8] Reserve Silica Rural Mining Site Conversion Project, May 1, 2016. Introduction, footnote pg. 1.
[9] Reserve Silica Corporation and Holcim (US) Inc. *Easement Agreement Involving Site Environmental Activities.* King County Recording no. 20110127000636.
[10] Reitenbach, Paul: Senior Policy Analyst, DDES. Letter to KC Council TrEE Committee. July 26, 2012.

2.7 Doesn't Reclamation for Forestry Conflict with the IFC and UW Study Conclusions?

[1] International Forestry Consultants, Inc. *Forestry Analysis*. Reserve Silica Response to King County's Proposed Forest Resource Classification, February 14, 2012. Appx. C.
[2] Bradley, Gordon, et al. *Reserve Silica Project Land Use Classification Evaluation.* University of Washington. March 12, 2012. Reserve Silica Response to King County's Proposed Forest Resource Classification, February 14, 2012, Appx. G.
[3] Bradley, Gordon, et al. *Reserve Silica Project Land Use Classification Evaluation.* University of Washington. March 12, 2012. Reserve Silica Response to King County's Proposed Forest Resource Classification, February 14, 2012, Appx. G, pg. 6.
[4] King County Rural Forest Commission. Letter to Larry Gossett, King County Council Chair. October 17, 2012.

2.8 Does This Property Meet GMA and King County Criteria for 'Forest Land of Long-Term Commercial Significance'?

[1] Reserve Silica Rural Mining Site Conversion Project, May 1, 2016. Introduction, pg. 1.
[2] International Forestry Consultants, Inc. *Forestry Analysis*. Reserve Silica Response to King County's Proposed Forest Resource Classification, February 14, 2012. Appx. C, pg. 29.
[3] Bradley, Gordon, et al. *Reserve Silica Project Land Use Classification Evaluation.* University of Washington. March 12, 2012. Reserve Silica Response to King County's Proposed Forest Resource Classification, February 14, 2012, Appx. G, pg. 14.
[4] Reserve Silica Response to King County's Proposed Forest Resource Classification, February 14, 2012. Introduction, pg. 3.
[5] Ryon, Dick. King County Rural Forest Commission, September 8, 2011 meeting notes, pg. 2.
[6] Sale of Hancock White River Tree Farm to Muckleshoot Indian Tribe, for whom timber production is not their primary management objective.

2.9 Why is Reserve Promoting Conversion to Rural Residential Development?

[1] Muyskens, J. D. Personal conversation regarding typical offers for approved, but unpermitted housing sites on rural lands surrounding the Vancouver, Washington area in 2015. Offers averaged ~$32,500/lot. Housing prices in King County have been running significantly higher than in the Vancouver, WA area, and SE King County housing prices have risen over 10% over the past year; leading to estimated 2016/2017 undeveloped lot prices in King County at ~$40K/lot.

2.10 Who Would Buy These Lands From Reserve if Upzone Denied and Property Reclaimed for Forestry?

[1] Melfi, Frank: President of Reserve Silica. Personal conversations on several occasions with Michael and Donna Brathovde. 2015 and 2016.
[2] Melfi, Frank: President of Reserve Silica. Personal conversation with Michael and Donna Brathovde. May 23, 2016.
[3] International Forestry Consultants, Inc. *Forestry Analysis.* Reserve Silica Response to King County's Proposed Forest Resource Classification, February 14, 2012. Appx. C, pg. 24.

3.2 What are the Environmental Risks and Human Health Hazards at the Ravensdale Reserve Silica Site?

[1] WDOE. Reserve Silica Site Hazard Assessment, Worksheet 1. January 2016. https://fortress.wa.gov/ecy/

[2] Holcim/Reserve Silica Easement Agreement dated Aug 27, 2002. Reserve Silica Response to King County's Proposed Forest Resource Classification, February 14, 2012. Appx. D, pg. 1.

[3] GeoEngineers. *Preliminary Environmental Conditions Letter Report, July 22, 2015*. Reserve Silica Demonstration Project Proposal, May 1, 2016. Appx. K, pg. 10.

[4] Model Toxics Control Act, Chapter 70.105D RCW.

[5] WDOE. Recommendation for Enforcement Action, Water Quality Program. Reserve Silica, Permit No. WAG 503029. June 21, 2016. https://fortress.wa.gov/ecy/

[6] WDOE. Reserve Silica Site Hazard Assessment: Facility Site ID #2041. Letters dated January 25, 2016 and February 29, 2016. https://fortress.wa.gov/ecy/

[7] WDOE. Reserve Silica Notice of Violation No. 13466. June 29, 2016. https://fortress.wa.gov/ecy/

3.3 Cement Kiln Dust (CKD)

[1] GeoEngineers. *Preliminary Environmental Conditions Letter Report, July 22, 2015*. Reserve Silica Demonstration Project Proposal, May 1, 2016. Appx. K, pg. 5.

[2] WDOE. *Lower Duwamish Waterway – Cement Kiln Dust: Summary of Existing Information.* April 2015. Cement Kiln Dust: Summary of Existing Information - Washington State DOE

[3] Wilson, Duff. Fateful Harvest: The True Story of a Small Town, a Global Industry, and a Toxic Secret. HarperCollins, New York. 2001.

[4] Seattle Times. *Men Burned by 'Mystery Mud' Were Warned, Firm Says*. March 3, 1981. http://www.genealogybank.com/

[5] GeoEngineers. *Preliminary Environmental Conditions Letter Report, July 22, 2015*. Reserve Silica Demonstration Project Proposal, May 1, 2016. Appx. K, pg. 5.

[6] WDOE. Reserve Silica Site Hazard Assessment Worksheet 1, January 25, 2016. https://fortress.wa.gov/ecy/ These pH measurements were recorded for surface water at the Infiltration Pond #1 and the Still Well respectively. Measurements at other sites indicated a maximum bedrock ground water pH of 7.73 and a maximum shallow ground water pH of 10.14.

[7] WDOE. Recommendation for Enforcement Action, Water Quality Program. Reserve Silica, Permit No. WAG 503029. June 21, 2016. https://fortress.wa.gov/ecy/

[8] USEPA. *Report to Congress on Cement Kiln Dust.* December 1993. http://nepis.epa.gov/

[9] GeoEngineers. *Preliminary Environmental Conditions Letter Report, July 22, 2015*. Reserve Silica Demonstration Project Proposal, May 1, 2016. Appx. K, pg. 5.

[10] WDOE. *Lower Duwamish Waterway – Cement Kiln Dust: Summary of Existing Information.* April 2015. Cement Kiln Dust: Summary of Existing Information - Washington State DOE

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[14] Richardson, Mark A. *Recycling or Disposal? Hazardous Waste Combustion in Cement Kilns: An Introduction to Policy and Legal Issues Associated with Burning Hazardous Waste in Cement Kilns.* April 1995. http://www.mindfully.org

[15] USEPA. *Report to Congress on Cement Kiln Dust.* December 1993. http://nepis.epa.gov/

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[17] Montana State Supreme Court. Minutes of the Montana Senate, Committee on Natural Resources, February 15, 1993: Exhibit no. 6. Montana State Supreme Court
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[24] Reserve Silica Demonstration Project Proposal, May 1, 2016. Appx. H: Interim Reclamation Plan, pg. 6.
[25] GeoEngineers. *Preliminary Environmental Conditions Letter Report, July 22, 2015.* Reserve Silica Demonstration Project Proposal, May 1, 2016, Appx. K, pg. 2.
[26] WDOE. Reserve Silica Site Hazard Assessment, Worksheet 1. January 2016. https://fortress.wa.gov/ecy/
[27] GeoEngineers. *Preliminary Environmental Conditions Letter Report, July 22, 2015.* Reserve Silica Demonstration Project Proposal, May 1, 2016, Appx. K, pg. 2.
[28] Reserve Silica Demonstration Project Proposal, May 1, 2016. Appx. H: Interim Reclamation Plan, pg. 6.
[29] Albuquerque Journal. *L-Bar Products Acquires Industrial Mineral.* March 9, 1986. https://www.newspapers.com/
[30] Reserve Silica Rural Mining Site Conversion Project, May 1, 2016. Appx. H: *Interim Reclamation Plan for the Ravensdale Quarry, May 2014.* Pg. 6.
[31] WDOE. Reserve Silica Site Hazard Assessment, Worksheet 1. January 2016. https://fortress.wa.gov/ecy/
[32] WDOE. Reserve Silica Site Hazard Assessment, Worksheet 1. January 2016. Pg. 2. https://fortress.wa.gov/ecy/
[33] Holcim/Reserve Silica Easement Agreement dated Aug 27, 2002. Reserve Silica Response to King County's Proposed Forest Resource Classification, February 14, 2012. Appx. D.
[34] Reserve Silica Corporation-Holcim (US) Inc. Easement Agreement Involving Site Environmental Activities. January 2011. KC recording no. 20110127000636.
[35] GeoEngineers. *Preliminary Environmental Conditions Letter Report, July 22, 2015.* Reserve Silica Demonstration Project Proposal, May 1, 2016, Appx. K, pg. 2.
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[46] WDOE. Reserve Silica: Notice of Violation No. 13466. June 29, 2016. Cover letter.
[47] WDOE. Reserve Silica: Notice of Violation No. 13466. June 29, 2016. Pg. 2.
[48] GeoEngineers. *Preliminary Environmental Conditions Letter Report, July 22, 2015.* Reserve Silica Demonstration Project Proposal, May 1, 2016, Appx. K. The GeoEngineers' report summarizes concerns about Groundwater and Surface Water on page 10 as follows: *"Groundwater and surface water could be impacted from former mining activity, processes and waste, CKD and landfill material leachate, potentially contaminated fill material, historic releases of hazardous substances, leaking USTs [underground storage tanks], and unknown adjacent property use. The potential for the documented CKD-impacted groundwater in the vicinity of the development areas may be minimal based on the location of the 15 groundwater wells and 4 surface water monitoring points on the Subject Property, but without identifying the impacted limits, surface and groundwater quality remain a potential environmental concern. In addition, other potential sources of surface and groundwater contamination on the Subject Property, other than CKD fill, may exist. Due to the limited sampling locations and analysis included in the current water quality monitoring program, other potential sources and/or recognized environmental conditions have not been evaluated. Therefore, it is possible that surface and ground water quality may present a risk to human health and the environment, which may dictate opportunities for future use of the property."*
The report goes on to summarize concerns about the Leachate as follows: *Although the LDA and Dale Strip Pit have been capped and a legal agreement with Holcim is in place for continued liability, leachate from the LDA and Dale Strip Pits continue to present an environmental concern for impacts to groundwater, soil, and the exposure to leachate. Leachate (in the form of surface water) is seeping out of the west side of the LDA, and west of the LDA into collection ditches, which fall outside of the conveyance infrastructure in the marsh areas, the south pond area, and in the infiltration ponds (Public Health – Seattle & King County 2014). Although the conveyance and infiltration facilities are in place, the capture of leachate within collection ditching and inlet infrastructure has not been reliable. The uncontrolled nature of the leachate and impacted surface waters result in exposure pathways impacting human health and the environment that could be an ongoing concern depending on future land use type. Although Holcim carries liability for the CKD filled pits, they have not provided complete control of the contamination impacts."*
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[2] Staff Comments. WDOE Water Quality Program meeting. June 27, 2016. (In attendance: Jerry Shervey, Chris Martin, Madeline Wall, and Biniam Zelelo of WDOE; Dan Dhillon of Seattle & King County Public Health.)

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[11] WDOE. Reserve Silica Site Hazard Assessment, Worksheet 1. January 2016.

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[4] Reserve Silica Rural Mining Site Conversion Project, May 1, 2016. Appx. D: Proposed Conservation Easement. Pg. 3.
[5] Reserve Silica Rural Mining Site Conversion Project, May 1, 2016. Introduction, pg. 7.
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[26] Albuquerque Journal. *L-Bar Products Acquires Industrial Mineral.* March 9, 1986. https://www.newspapers.com/

[27] Seattle Times. *Fear in the Fields, Part I: How Hazardous Wastes Become Fertilizer – Spreading Heavy Metals On Farmland Is Perfectly Legal, But Little Research Has Been Done To Find Out Whether It's Safe.* July 3, 1997. http://community.seattletimes.nwsource.com/ Also, link to entire Duff Wilson Seattle Times *Fear in the Fields* series and book, Fateful Harvest can be found at http://www.bioethicscourse.info/

[28] Spokesman-Review. *State Refuses Use of Quarry as Waste Site.* November 30, 1983. https://news.google.com/newspapers

[29] Chemical & Engineering News. *Hazardous Waste Finds Use as Low-cost Fertilizer.* December 24, 1984. http://www.sciencemadness.org

[30] US Patent 4692259 A. 1986-87. *Water-Activated, Exothermic Chemical Deicing Formulations*. http://www.google.com/patents/US4692259. Patent application notes that the deicing product can also be used as fertilizer.

[31] Albuquerque Journal. *L-Bar Products Acquires Industrial Mineral.* March 9, 1986. https://www.newspapers.com/

[32] Louisiana Pacific v. ASARCO, et al. 1993. http://openjurist.org/

Attachment 6

Greater Maple Valley Unincorporated Area Council Memo dated December 7, 2018

December 7, 2018

To: Madeline Wall, Reserve Silica Cleanup Site Manager, madeline.wall@ecy.wa.gov
Tim O'Connor, Reserve Silica Cleanup Site Manager, mailto:tioc461@ecy.wa.gov

Re: State of Washington Department of Ecology Draft Agreed Order No. DE 16052 and Public Participation Plan in response to the Department's Publication 18-07-021 (*"Reserve Silica - Comment Period for Agreed Order"*)

Ms. Wall and Mr. O'Connor,

Please accept comments herein on the subject documents from the Greater Maple Valley Unincorporated Area Council (GMVUAC). We research and strive to develop solutions on issues of interest to people who live in King County's Rural Area.

We strongly support the set of comments submitted to DOE by Rural Area citizens Michael and Donna Brathovde on November 21, 2018. Their research and insights over the years on this site are invaluable to our community and we strongly suggest the Department of Ecology (DOE) consider them carefully. In addition, we provide the following comments:

C1 1. Groundwater Issues (prepared by Marcia Knadle, Member of the GMVUAC Environment Committee; Retired EPA Region 10 hydrogeologist, WA Geologist and Hydrogeologist License #1730; mknadle1@aol.com).

The various reports lack groundwater flow maps, which reflects a lack of widely distributed water level monitoring points. We found just one water-level contour map, which covered only the Plant Site lot roughly downgradient of the Infiltration Ponds area, in the Nov. 2017 Draft Remedial Investigation (RI). A major goal of the RI should be to develop a robust hydrogeologic conceptual site model, and we believe additional wells (at least piezometers) will be necessary. In particular, an overall understanding of each groundwater flow zone is needed across the site, especially, if any sort of groundwater modeling is contemplated.

There are four major areas of concern where groundwater has been investigated. The Dale Strip Pit has 6 wells, of which 2 are shallow and 4 are in bedrock. Two of the wells are likely upgradient, so that leaves few wells to evaluate impacts to groundwater. The wells are mostly located along a line, which limits the development of reliable groundwater head maps. That said, the bedrock geology here very likely imposes aquifer anisotropy to the extent that groundwater flow is not necessarily perpendicular to head gradient anyway, so it is clear that additional wells would likely be valuable in assessing these effects.

The Lower Disposal Area (LDA) and Infiltration Pond area have similar issues regarding the layout of wells limiting the ability to evaluate groundwater flow directions, both in bedrock (for the LDA) and in the shallow zone. The wells are either mostly along a line or are clustered in a very small area. The Nov. 2017 Draft RI includes wells in the Plant Area that were not evaluated in DOE's 2016 Site Hazard Assessment, even though one exceeded the Model Toxics Control Act (MTCA) B arsenic level, albeit just barely.

We find no information in the various reports as to how wells were sampled or how the samples were handled, both of which can have a large effect on inorganics concentrations. This is typically included in sampling and analysis plan sections of work plans, but should be summarized in the reports where chemical data is presented.

We have seen logs for at least the shallow zone wells, and they appear to be appropriately screened, although 15-foot screens are a bit longer than the norm.

C1a We agree (see the Brathovdes' comments) that, given the wide variety of site uses over the years, at least initial groundwater and surface water sampling should include the full list of pollutants that may have been been disposed on site. It is important to cast a wide net initially to ensure that no important contaminants of concern (COCs) are missed.

C1b Moreover, looking back at DOE's 2016 Site Hazard Assessment, we believe the analysis of which concentrations found in groundwater exceed MTCA B levels doesn't include an important issue regarding Manganese. Nor does Manganese appear to have been analyzed in all areas of the site. From DOE's Cleanup Levels and Risk Calculation's (CLARC's) *"Cautions and Limitations"* page:

- **Manganese** — CLARC provides pre-calculated standard Method B or C formula values for manganese. The formula value for manganese depends on the reference dose (RfD). The reference dose was obtained from the U.S. Environmental Protection Agency's Integrated Risk Information System (IRIS), but was not modified as recommended by the EPA. The recommended modification depends on the route of exposure. EPA recommends that a modifying factor of "1" should be used when assessing exposure from food and that a modifying factor of "3" should be used when assessing exposure from drinking water or soil. This modification factor is based on the increased exposure of children to manganese-contaminated water and soil. Please consult IRIS for a more complete description of the basis for the modification factors. As noted, the RfD for manganese listed in CLARC and used to pre-calculate the formula values for standard Method B and C has not been adjusted. <u>If the modifying factor of "3" for manganese is used, then the formula values for standard Method B and C for soil and ground water would be one-third the value presented in CLARC</u> (our <u>emphasis</u> above).

That would make the appropriate Groundwater Method B level for evaluating Manganese in groundwater 747 ug/L instead of 2240 ug/L. That level has been exceeded on site, so Manganese should be retained as a contaminant of concern.

C2 2. <u>Modeling and Monitoring</u> (prepared by Peter Rimbos, Chair of the GMVUAC Growth Management Committee; Retired Boeing Principal Engineer and Project Manager, <u>primbos@comcast.net</u>).

There is insufficient definition of what the Potentially Liable Parties (PLPs) must do to *model, validate, analyze, and re-evaluate* contaminant flows through various geological layers over time and under various circumstances. We see no *feedback mechanisms* called for by DOE to use such modeling to better understand events that may occur over time that were *not* predicted. In any good system where one wants to understand the physical behaviors occurring, one needs to continually refine the conceptual model used to predict what could occur, so the why's and how's can be better understood. We don't see any of this called for.

Further, the *monitoring*, which is called for, is not required to be linked to any of the model work, such that it will not be understood the why's and wherefore's of the monitoring results. This could lead to dead-ends where it will not be known how to fashion a true cleanup plan that will work over time.

How will DOE be able to understand the behaviors of future contamination flows and why they are occurring and ensure contaminants are contained (or completely removed from the site)?

<u>Reference</u>: **Exhibit B, Task 1. Remedial Investigation (RI) Work Plan** — (our <u>emphasis</u> below)

> *p. 2 of 9, para. 3: "The Work Plan shall describe general facility information; site history and conditions; including previous operations; past field investigations, including any data collection and analysis of soils, air, groundwater, surface water, and sediments;*

a conceptual site model showing contaminants, migration pathways in all environmental media, potential receptors, and screening levels based on the conceptual site model; geology and groundwater system characteristics; past, current, and future land use; identification of natural resources and ecological receptors; hazardous substances and their sources, etc., in compliance with WAC 173-340-350 and WAC 173-204-560." and

*p. 3 of 9, para. 4: " * Develop a preliminary conceptual site model for the Site including evaluation of all potential pathways and potential receptors that may exist for contaminants of concern at the Site."*

C3 3. Work Plan (prepared by Rhys Sterling, Chair of the GMVUAC Environment Committee; P.E., J.D., Attorney at Law; Former DOE Supervisor, Environmental Quality Section, Eastern Regional Office; rhyshobart@hotmail.com).

The Draft Agreed Order and Public Participation Plan should be amended to include a required public comment period regarding and relating to the forthcoming Work Plan, so that members of the Public have an opportunity to review and comment on it before it is implemented as part of the RI / Feasibility Study.

To ensure the Public Participation Plan addresses and includes public notice and an opportunity for the public to submit comments to DOE on the draft Work Plan *before* it is finalized, we suggest the following modified excerpt from DOE's November 30, 2018, e-mail be included in the final Public Participation Plan:

"The proposed RI Work Plan will be made available to the public for review and comment before it is finalized and implemented. Because Work Plans are generally not subject to formal public review and comment, in addition to posting notice on its Document Repository for Reserve Silica Corporation website the Department will send a Notice of Draft Work Plan Availability to only those individuals and entities who have submitted written comments on the Draft Agreed Order and/or Public Participation Plan. The Department will consider all public comments received and appropriately include such comments in the final Work Plan."

We wish to continue an open dialogue with DOE officials on Reserve Silica site cleanup. Thank you in advance for your careful consideration of our comments.

Rhys Sterling
rhyshobart@hotmail.com
Chair, Environment Committee
Greater Maple Valley Unincorporated Area Council

Steve Hiester
info@gmvuac.org
Chair, Greater Maple Valley Unincorporated Area Council

cc: Dow Constantine, King County Executive: dow.Constantine@kingcounty.gov
King County Councilmember:, reagan.dunn@kingcounty.gov
Alan Painter, Manager, King County Community Service Areas: alan.painter@kingcounty.gov
Jim Chan, Interim Director, King County Department of Permitting & Environmental Review: jim.chan@kingcounty.gov
John Taylor, Director *(appointee)*, King County Department of Local Services: john.taylor@kingcounty.gov
Mark Mullet, State Senator, 5th legislative District, mark.mullet@leg.wa.gov

Attachment 7

Comment from Hendrick Haynes dated December 7, 2018

Attachment 7

From: noreply@smartcomment.com
To: hh.gmvuac@gmail.com
Subject: Reserve Silica Agreed Order comment
Date: Friday, December 7, 2018 4:32:56 PM

Thank you for your comments on the Reserve Silica Agreed Order. Your comments have been received.

Name: Hendrick Haynes
Address: 17427 - 195th Place SE
City: Renton
State: Washington
ZIP: 98058
Email: hh.gmvuac@gmail.com

Reserve Silica Agreed Order

2018DEC7 about 4:32 pm

C1 I appreciate what the owners of the Reserve Silica Site are doing, and the Washington State Department of Ecology, and wish them well in their efforts. However, significant dangers seem not addressed as related to emergency planning and securing unloading of waste from the site during and following a geological emergency. The site seems located on or near a fault zone, and radiating scarps, which during changes or shifts in geometry may allow pollutants to quickly follow or intrude into unplanned for sites. This could compromise deep aquifers which serve far reaching public water supplies, the shallower depth water supplies of adjacent land owners, and also could contaminate surface water flows of streams, rivers, and lakes (affecting surface flora and fauna). Not to isolate the Reserve Silica Site as the only site of concern, an quick response emergency plan should be available that allows for sealing off of surface leakage zones opened up or created by catastrophic events (including equipment failures, acts of sabotage or misjudgment, etc.), as well as much deeper events as considered above. This would include (naturally) such site having in place sensors and equipment for monitoring seismic activity, flows, and contamination levels at key places, and providing for alarm means for setting in motion emergency measures. Other options may include an ability to do emergency drillings, and the injection of materials to seal off and neutralize the flow(s) of agents into areas of concerns.

Such contingency planning development is not foreign to engineering practice(s). If one has ever flown in an airliner, one may recall the "crash" or "ditching" procedures the passengers are made acquainted with, and this (of course) compliments crew training and the designing in of special systems and hardened structures designed to improve passenger safety.

As you are likely well aware, we do live near a volcano (Mount Rainier),

and we do have a near term history of volcano eruptions in this region (1980 eruption of Mount St. Hellens). To our north is Mount Baker, and we have other features as well, which would seem to highlight our zone. You may also note that USGS publishes updates on seismic activity in our area (on the internet) with some frequency, and activity about the Black Diamond - Maple Valley area happens with significant frequency.

I live on Cedar Mountain, which is near the town of Maple Valley. It is a "saddle back" feature which seems separated by a scarp, and low grade seismic activity can be felt by local residents with some frequency. This area is similar to many areas in the region. See USGS for more information.

Thank you for this opportunity to comment.

Most respectfully, I remain at your humble service;

Hendrick W. "Hank" Haynes

Attachment 8

Coal Reference Documents

- Washington Geological Survey (WGS, 1912), The Coal Fields of King County, Bulletin No. 3, http://www.dnr.wa.gov/publications/ger_b3_coal_fields_kingcounty.pdf

- U.S. Geological Survey (USGS, 1945), Coal Fields of King County, Washington, USGS Open File Report 45-17, Plate 1, https://pubs.er.usgs.gov/publication/ofr4517

- Washington Division of Mines and Geology (WDMG, 1947), Coal and Coal Mining in Washington, Report of Investigations No. 4R, http://file.dnr.wa.gov/publications/ger_ri4r_dmm_coal_coalmining_wa.pdf

- USGS (1969), Geology and Coal Resources of the Cumberland, Hobart, and Maple Valley Quadrangles, King County, Washington, USGS Professional Paper 624, https://pubs.er.usgs.gov/publication/pp624

- Washington State Department of Natural Resources (DNR, 1994), Coal Mine Map Collection, Open File Report 94-7, https://www.dnr.wa.gov/programs-and-services/geology/energy-mining-and-minerals/coal-metallic-and-mineral-resources/coal. Specially, the following map series were reviewed:
    - K56 series, Ravensdale Area Mines,
    - K57 series, Ravensdale Area-Geological Cross Sections and Log of Prospect Pits,
    - K58 series, Ravensdale Mine,
    - K59 series, Ravensdale No. 1 Mine,
    - K60 series, Ravensdale No. 2 Mine (McKay Workings),
    - K61 series, New McKay Mine, and
    - K62 series, Dale No. 1 Mine (includes Dale No. 4 and Dale No. 7).

- Historical photographs and documentation provided by Michael Brathovde in emails on January 28 and 30, 2019.

Attachment 8: Coal Reference Documents

- Washington Geological Survey (WGS, 1912), The Coal Fields of King County, Bulletin No. 3, http://www.dnr.wa.gov/publications/ger_b3_coal_fields_kingcounty.pdf

- U.S. Geological Survey (USGS, 1945), Coal Fields of King County, Washington, USGS Open File Report 45-17, Plate 1, https://pubs.er.usgs.gov/publication/ofr4517

- Washington Division of Mines and Geology (WDMG, 1947), Coal and Coal Mining in Washington, Report of Investigations No. 4R, http://file.dnr.wa.gov/publications/ger_ri4r_dmm_coal_coalmining_wa.pdf

- USGS (1969), Geology and Coal Resources of the Cumberland, Hobart, and Maple Valley Quadrangles, King County, Washington, USGS Professional Paper 624, https://pubs.er.usgs.gov/publication/pp624

- Washington State Department of Natural Resources (DNR, 1994), Coal Mine Map Collection, Open File Report 94-7, https://www.dnr.wa.gov/programs-and-services/geology/energy-mining-and-minerals/coal-metallic-and-mineral-resources/coal. Specially, the following map series were reviewed:
    - K56 series, Ravensdale Area Mines,
    - K57 series, Ravensdale Area-Geological Cross Sections and Log of Prospect Pits,
    - K58 series, Ravensdale Mine,
    - K59 series, Ravensdale No. 1 Mine,
    - K60 series, Ravensdale No. 2 Mine (McKay Workings),
    - K61 series, New McKay Mine, and
    - K62 series, Dale No. 1 Mine (includes Dale No. 4 and Dale No. 7).

- Historical photographs and documentation provided by Michael Brathovde in emails on January 28 and 30, 2019.

Attachment 9

Historical photographs and documentation provided by Michael Brathovde
in emails on January 28 and 30, 2019

Attachment 9

Historical Photographs and Documentation

Provided by Michael Brathovde in emails on January 28 and 30, 2019

Additional Photos of Dale Coal Co Facilities previously located on current Reserve Silica site

1928 photo of Dale Coal Co processing facilities. Briquette Plant is photo right.

Source: This panoramic photo is available from Washington State Historical Society, in two separate images, #1943.42.53901&2. Asahel Curtis Collection. Stitching together of two images by Donna Brathovde.

Dale Coal Plant, 1927.

Dale Briquette Plant, 1927.

Source: Photo available from Washington State Historical Society, #1943.42.52961 & #1943.42.52964. Asahel Curtis Collection. Coal Plant photo also published in Seattle Daily Times, Oct 23, 1927 & Dec 4, 1927.

Dale Processing Plant from South; Ravensdale Lk in background. Coal storage where Reserve Silica Plant Site is today.

Photos by Hayden Morgan, ca 1933; as published in Ravensdale Reflections, 2004, by Barbara Nilson.

Property of Maple Valley Historical Society

Dale Coal Co processing facilities, 1944.

Source: Photo courtesy of Maple Valley Historical Society, #85.112.1. Also available from UW id 117, and Bill Kombol Pcc173.

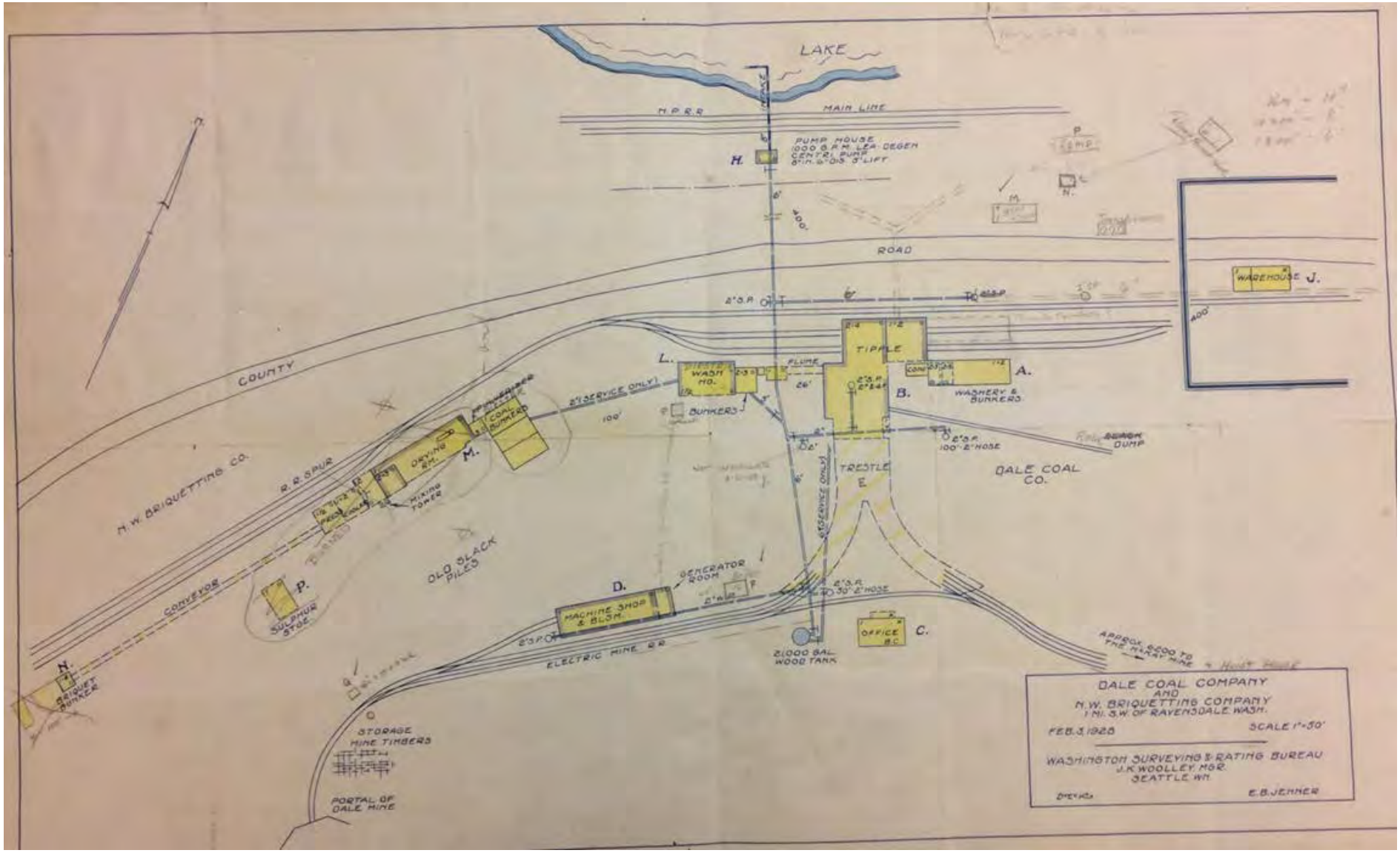
Demolishing Dale facilities, 1955.

Source: Seattle Intelligencer, April 15, 1955.

Dale Coal Mine facilities, February 3, 1928 (with pencil updates to 1929 or beyond).

Note that the Dale Coal Company leased the Ravensdale Mine lands, remaining buildings and townsite from the Northwestern Improvement Company (a Northern Pacific subsidiary) in 1924. They constructed the Dale Mines, reopened the McKay (formerly Ravensdale No. 2) Mine, built all new coal processing facilities, and re-built many of the Ravensdale residences between 1924 and 1929. They held their official opening of the Dale-McKay Mines on Oct 21, 1927.

From Minnesota Historical Society, Northern Pacific archives, Location 137.I.13.1B; #1567; 1928-02-03.



Enlargement of upper right of Dale Facility map showing Transformer location; note: power was reportedly supplied by Puget Sound Power and Light.

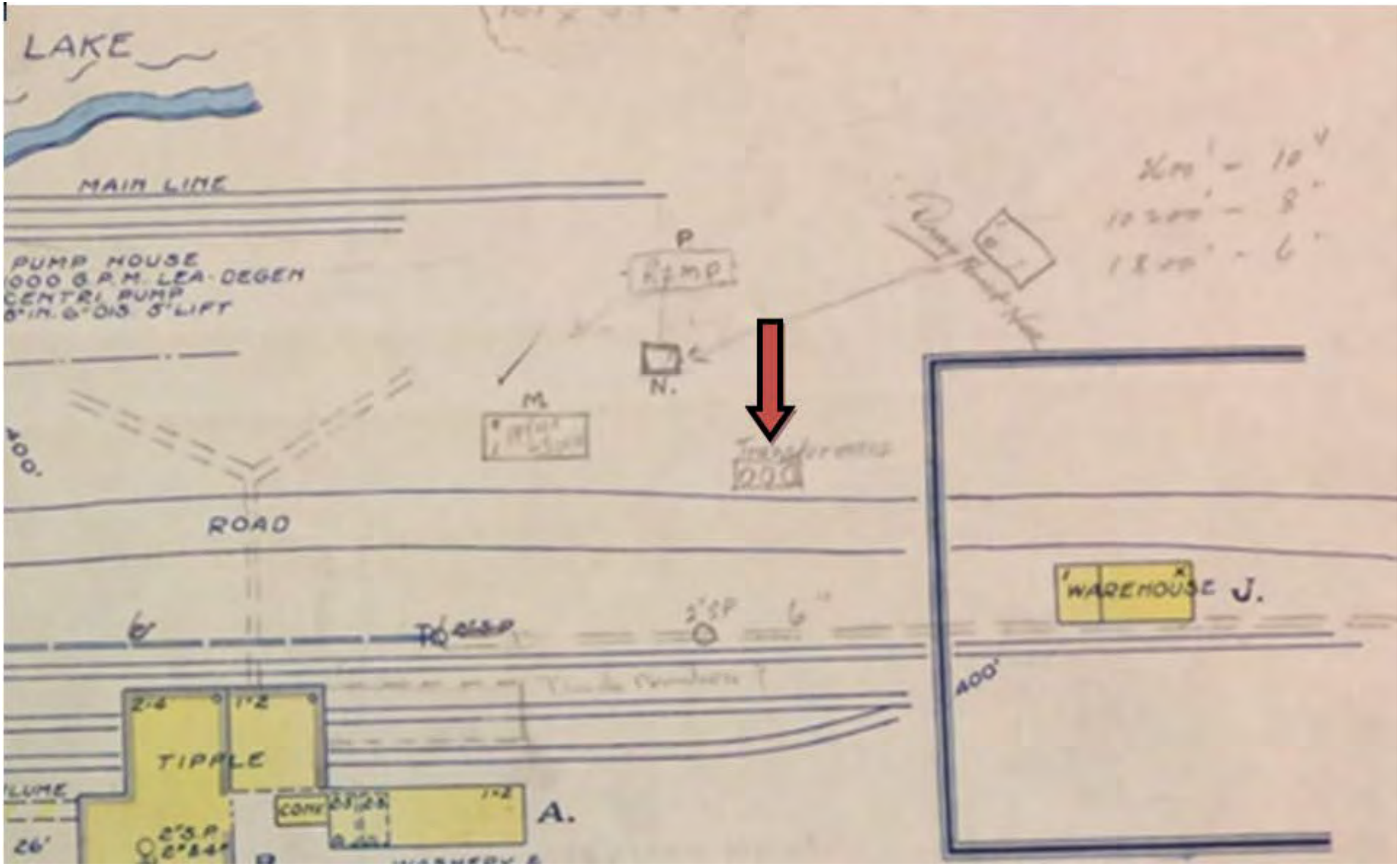


Photo of sister transformer at Dale-McKay mine entrance

Photo 16-22; Dale Power House-1940 (16 Dale Mines)

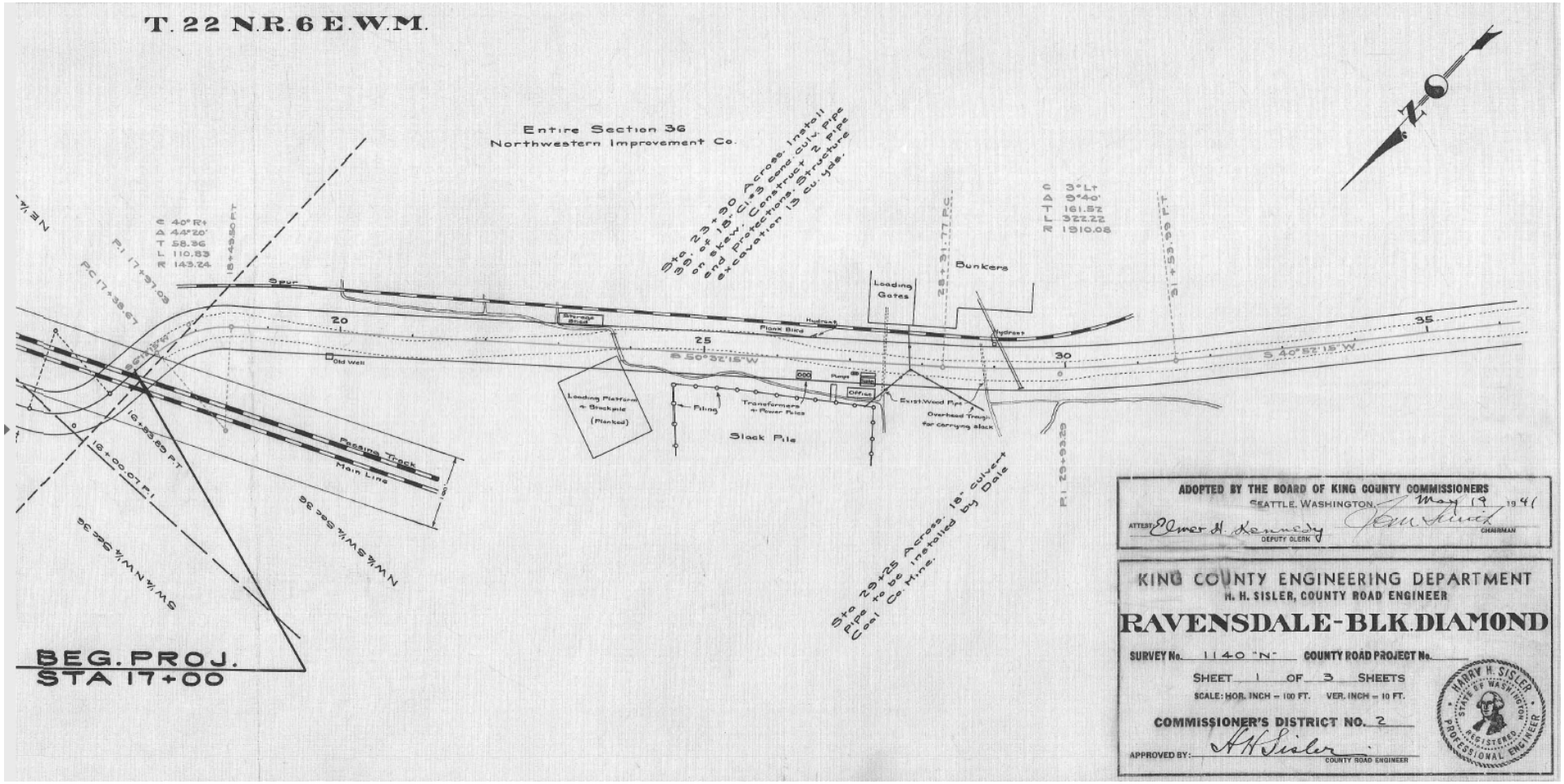
Source: Photo courtesy of Puget Sound Regional Archives (PRSA), Bellevue, WA.

This photograph shows what was apparently the power house/transformers for the Dale Coal Company's McKay Mine. Regional Archives data indicates this was located in the SE ¼ of SE ¼ of SW ¼ of Sec 36, 22-06, in current Parcel No. 362206-9009; which would locate this in close proximity to the Dale Coal Co portal to the McKay mines. PSRA also indicates this structure was demolished in 1955, the same year as the rest of the Dale Coal facilities were demolished. The photograph was taken January 10, 1940.

Note that a 1928 Dale Coal Company facility map shows a similar transformer installation located between the county road and the Northern Pacific mainline, just east of the Dale tipple. This 'twin' transformer presumably powered the Dale Coal processing facilities and the Dale Mines (and likely the town?).

Before the Ravensdale Mine explosion in November 1915, the Northwestern Improvement Company (NWI) produced their own electricity, by burning coal in a Boiler House, to produce steam, then running the steam through a generator to produce electricity to power the mine and the town. After the NWI shut down the mines following the explosion, all of this infrastructure was removed, with much of the machinery moved to other NWI mines. When the Dale Coal Company leased the lands and town from NWI in 1924, they had to build new infrastructure (new store, hotel, bunkhouse, coal processing facilities, office, bunkers, etc.), to replace that removed by NWI. For power, however, they contracted with Puget Sound Power and Light to bring in power, rather than producing their own.

Ravensdale-Black Diamond Rd; 1941; Map 55-72.A; KC Road Services, Map Vault; Sec 36 (22-06) pg 3



1945 Northern Pacific Insurance correspondence, and
1927 Coal Mine Inspector report describing Dale Coal Company facilities

1945-08-10-a; M93; from Minnesota Historical Society, Northern Pacific archives, Location 137.I.13.1B; #1567.

File Title: Northwestern Improvement Company Insurance on Ravensdale, Washington, Mine Properties, 1945.

Notes: Correspondence and Insurance documents following Northwestern Improvement Company take-over of Dale mines. Includes detailed accounting of buildings and assets taken over; including which buildings were located at McKay portal, vs main plant site, vs other locations.

Image:

C O P Y

NORTHWESTERN IMPROVEMENT CO.
OFFICE OF
MANAGER OF COAL OPERATIONS
SEATTLE, WASH.

August 10, 1945

Mr. J. M. Hughes
Vice President
St. Paul, Minn.

Please note attached file regarding the insurance schedules for Ravensdale furnished me by the R. I. Martin Company of Spokane.

The net coverage is $141,560.00 and the cost for an 18-month period is $2,817.89.

This seems to me a high rate and an excessive coverage, particularly in the mining equipment items which, by the way, we do not insure at Roslyn at all.

I attach a list of the various items showing coverage as per the policies and a second column showing the suggested values. Conditions are somewhat different at Ravensdale and perhaps it would be best to have equipment at Ravensdale partially covered at least.

If you agree, I suggest the present policies be cancelled and new policies taken at the proposed values.

(sgd) D. R. Swem

Manager of Coal Operations

DRS:lb

Encl.

RAVENSDALE INSURANCE SCHEDULES

	Coverage as per Policies	Suggested Values
Tipple, Washery and bunkers	38,000.00	30,000.00
Washery	6,946.34	5,000.00
Winch House	30.00	30.00
Winch House Contents	600.00	600.00
Trestle	3,000.00	2,500.00
Superintendent's Office	1,173,00	1,000.00
" " Contents	900.00	900.00
Boiler House	180.00	150.00
" " Contents	20.00	-
Machine and Forge Shop	1,558.32	1,250.00
" " " " Contents	2,988.17	2,500.00
Oil House	75.00	75.00
" " Contents	200.00	200.00
Powder House	180.00	175.00
" " Contents	1,200.00	1,000.00
Warehouse	180.00	175.00
" Contents	500.00	400.00
Office and Scale House	1,200.00	1,100.00
Winch House	75.00	75.00
" " Contents	400.00	300.00
Storage Ramp	1,150.00	1,000.00
Water Pump House	100.00	100.00
" " " Contents	2,225.00	2,000.00
Change House	5,000.00	4,000.00
" " Contents	5,000.00	2,000.00
Sand Shed	75.00	75.00
" " Contents	75.00	75.00
Powder House	150.00	125.00
Lamp and Battery House	378.00	300.00
" " " " Contents	2,000.00	1,700.00
Hoist House	550.00	450.00
" " Contents	5,000.00	3,000.00
Generator House	250.00	225.00
" " Contents	5,000.00	3,000.00
Compressor House	800.00	600.00
" " Contents	3,000.00	2,000.00
Shelter Shed	25.00	25.00
Fan House	70.00	50.00
" " Contents	2,000.00	1,800.00
Rolling Stock	29,000.00	5,000.00
Chlorination Plant	135.00	100.00
" " Contents	720.00	500.00
Underground Hoists	8,000.00	5,000.00
Underground Loaders and Slushers	3,500.00	2,500.00
" Pump and Motor	3,250.00	2,250.00
" Miscellaneous Equipment	20,000.00	5,000.00
	157,288.83	90,305.00
Less 10%	15,728.80	
	141,560.03	

Map Reference: W.S.& R.B. Map **Date of Original Page: May 15, 1934**

Line	LOCATION	Class	RISK	Bldg.	Conts.
1			**SCHOOLS**		
2	**Sheet 1, Block 1**				
3	**Main Avenue N/S**				
3a			Tahoma School District No. 409		
4	**(A)**	**D**	New Grade School—6	104	104
5	**Next W. (B)**	**D**	School Gymnasium—6	128	128
6	**100 feet S. of above**	**D**	Bus Garage—6	220	220
7			King County		
8		D	Grandstand	289	289
9			**MISCELLANEOUS RISKS**		
10	**Sheet 1, Block 10**				
11	On R.R. Right-of-way (101)	D	2 Story Frame	290	290
12			N. P. Depot		290
13	**1 Mile S.W. of Town**				
14			㉔■**Continental Coal Co. (formerly Dale Coal Co.)**		
15	(A-B)	D	Tipple, Washery & Bunkers	283	283
16	Next W. (L)	D	Washery	283	283
17	Adj. S. of Bunkers (Q)	D	Winch House	283	283
18	Adj. S. of Tipple (E)	D	Trestle	278	278
19	Next S. (C)	D	Superintendent's Office	232	232
20	NW across tracks (F)	D	Boiler House	260	260
21	Next W. (D)	D	Machine & Forge Shop	253	253
22	Next W. (G)	D	Oil House	295	295
23	200 feet W. (I)	D	Powder House—10	1000	1000
24	400 feet E. of Bunkers (J)	D	Warehouse	287	287
25	N. of Bunkers (M)	D	Office & Scale Ho.	224	224
26	NE of above (N)	D	Winch House	212	212
27	N. of above (P)	D	Storage Ramp	195	195
28	W. of above (H)	D	Water Pump House	213	213
29	Near Townsite	D	Change House	249	249
30	**At McKay Portal**				
31	(1)	D	Sand Shed	220	220
32	(2)	D	Powder House—10	1000	1000
33	(3)	D	Lamp & Battery Ho.	236	236
34	(4)	D	Hoist House	220	220
35	(5)	D	Generator House	220	220
36	(6)	D	Compressor Ho.	220	220
37	(7)	D	Shed (Old Comp. Ho.)	216	216
38	(8)	D	Fan Ho.	216	216
39	**2 Miles N.E. of Town**				
40			㉔**City Coal Mine Co.**		
41		**D**	**Coal Tipple & Bunker**	310	310
42	**17 feet W.**	D	**Office**	381	381
43		D	**Winch House**	339	339
44	**3 Miles W. of Town**				
45	Black Diamond-Renton Hwy	D	1 Sty Fr. (Palmer Coal Co.)	328	328
46			Weigh Ofc. & Serv. Stn.		328

㉔ **For specific rules governing mining properties, see Mining Properties and Dredges, General Rules—Washington.**

■ ⊡ **Continental Coal Co.** Buildings and equipment: as per form on file. Blanket rate 2.12; Effective 4-1-45; expires 10-1-46.

⊡ **Rate(s) do not affect policies in force prior to November 5, 1942; therefore, the pro rata cancellation of policies for the purpose of rewriting at a reduced rate that may be named on any risk is not in order.**

CHANGES: Footnote ■.

INSURE-BE SURE
R.J. MARTIN & Co.
INCORPORATED 1910
MAIN-3366

R.J. MARTIN & Co.

INSURANCE
MORTGAGE LOANS

PAULSEN BUILDING
SPOKANE, WASHINGTON

FIRE
HEALTH
ACCIDENT
LIABILITY
AUTOMOBILE
BURGLARY
LIVE STOCK
PLATE GLASS
SURETY BONDS

August 9, 1945

Mr. D. R. Swem
Northwestern Improvement Company
1011 Smith Tower
Seattle 4, Washington

Dear Mr. Swem:

Some time ago Mr. Pearce of Continental Coal Company asked me to send to you the distribution of insurance at each location, which I did some weeks ago. After reading your letter of August 7, I am not sure that you got my memorandum giving you this information. In as much as our office copy was mailed to you I do not have a duplicate, however we are enclosing copy of distribution of values filed with the Rating bureau. Incidentally last winter Mr. Ramage reduced the insurance consequently the total insurance carried does not equal 90% of the declared value on attached sheet.

If you will read the enclosed copy of form you will note that the coverage on property is blanket except property excluded in the 4th paragraph or exclusion clause. Your records show that the frame boarding house, frame lodging house and dwellings, are covered under separate policies, consequently these items are excluded in the blanket form on property. Your obligation however is to carry 90% of the sound insurable values.

The rates and premium shown on the Washington Rating & Surveying bureau list is subject to a discount of 30%. If we can be of any further service, do not hesitate to advise.

Yours very truly,

R. J. MARTIN & CO.

PRESIDENT

RJM:ig

P. S. Enclosed is blue print of Tippple group of buildings

39

WASHINGTON SURVEYING AND RATING BUREAU—SEATTLE, WASH.

BLANKET INSURANCE

Covering buildings & equipment., in accordance with approved form on file with Washington Surveying and Rating Bureau.
(Buildings, Equipment and/or Stock)

Insured Dale Coal Company — Effective Dec. 16, 1941

Town(s) Ravensdale, Wn. — Expires June 16, 1943

ITEMS INSURED	Rate Reference Page or Blk.	Rate Reference Line	INSURABLE VALUE	90 % Rate X	PREMIUM X
Building) tipple, washery &	3	15	38,000.00	2.22	$ 843.60
Equipt) bunkers (A-B)					
Stock					
Building) washery (L)	3	16	$ 6,946.34	2.22	154.20
Equipt)					
Stock					
Building Winch house (Q)	3	17	30.00	2.22	.67
Equipt.			600.00		13.32
Stock					
Building Trestle (E)	3	18	3,000.00	2.17	65.10
Equipt.					
Stock					
Building Superintendent's	3	19	1,173.00	1.78	20.88
Equipt. office (C)			900.00		16.02
Stock					
Building Boiler House (F)	3	20	180.00	1.68	3.02
Equipt.			20.00		.34
Stock					
Building Machine & Forge	3	21	1,558.32	1.97	30.69
Equipt. Shop (D)			2,988.17		58.86
Stock					
Building Oil House (G)	3	22	75.00	2.55	1.91
Equipt.			200.00		5.10
Stock					
Building Powder house (I)	3	23	180.00	10.00	18.00
Equipt.			1,200.00		120.00
Stock					
Building Warehouse (J)	3	24	180.00	2.66	4.79
Equipt.			500.00		13.30
Stock					
Building) Office & Scale	3	25	1200.00	1.65	19.80
Equipt) house (M)					
Stock					
Building Winch house (N)	3	26	75.00	1.62	1.21
Equipt.			400.00		6.48
Stock					
Building Storage ramp (P)	3	27	1,150.00	1.38	15.87
Equipt.					
Stock					
Building Water pump house	3	28	100.00	2.13	2.13
Equipt. (H)			2,225.00		47.39
Stock					
Building Change house	3	29	5,000.00	2.49	124.50
Equipt.			5,000.00		124.50
Stock					
Building					
Equipt.					
Stock					
TOTALS					1711 68

Blanket 1-year rate with ____ % ____ Clause

90% rates 8th class with Watchman & Clock except: Warehouse (J), Water Pump House (H) and Change House.

WASHINGTON SURVEYING AND RATING BUREAU—SEATTLE, WASH.

Sheet #2

BLANKET INSURANCE

Covering buildings & equipment (Buildings, Equipment and/or Stock), in accordance with approved form on file with Washington Surveying and Rating Bureau.

Insured Dale Coal Company — Effective Dec. 16, 1941

Town(s) Ravensdale, Wn. (AT MCKAY PORTAL) — Expires June 16, 1943

ITEMS INSURED	Rate Reference Page or Blk.	Rate Reference Line	INSURABLE VALUE	—% Rate	PREMIUM
Building Sand Shed (1)	3	31	$ 75.00	2.15	$ 1.61
Equipt.			75.00		1.61
Stock					
Building Powder house (2)	3	32	180.00	10.00	18.00
Equipt.			400.00		40.00
Stock					
Building Lamp & Battery	3	33	378.00	2.31	8.73
Equipt. house (3)			2,000.00		46.20
Stock					
Building Hoist house (4)	3	34	550.00	2.15	11.82
Equipt.			5,000.00		107.50
Stock					
Building Generator house	3	35	250.00	2.15	5.37
Equipt. (5)			5,000.00		107.50
Stock					
Building Compressor house	3	36	800.00	2.15	17.20
Equipt. (6)			3,000.00		64.50
Stock					
Building Shelter shed (7)	3	37	25.00	2.11	.53
Equipt.					
Stock					
Building Fan house (8)	3	38	70.00	2.11	1.48
Equipt.			2,000.00		42.20
Stock					
Building Rolling stock	Gen. Par.		29,000.00	1.00	290.00
Equipt.					
Stock					
Building Chlorination Plant	1	29	135.00	2.37	3.20
Equipt. (Lake Retreat)			720.00		17.06
Stock					
Building Underground hoists			8,000.00	1.25	100.00
Equipt.					
Stock					
Building Underground loaders & slusher			3,500.00	1.25	43.75
Equipt.					
Stock					
Building Underground pumps & motors			3,250.00	1.25	40.62
Equipt.					
Stock					
Building Underground miscellaneous equipment			20,000.00	1.25	250.00
Equipt.					
Stock					
Building					
Equipt.					
Stock					
Building					
Equipt.					
Stock					
TOTALS					

Blanket 1-year rate with ____% ____Clause

2817.89

Flat rates 10th Class with Watchman & Clock.

x Less 30% Commission & Taxes

[Note: insurance maps attached to this document are documented in 1928-02-03-a and 1945-07-23-a.]

C O P Y

NORTHWESTERN IMPROVEMENT CO.
OFFICE OF
MANAGER OF COAL OPERATIONS
SEATTLE, WASH.
July 31, 1945

Mr. J. M. Hughes
Vice President
St. Paul, Minn.

I am forwarding under separate cover 3 prints of the Insurance Map of Ravensdale.

The schedule accompanying Hartford Fire Insurance Company policy #14323 covers the following:

1	Boarding House	1350.00
2	Equipment in house	600.00
3	Lodging house	2250.00
4	Equipment in house	900.00
		5100.00

Hartford Fire Insurance Company's policy #14086 should be corrected to the following schedule:

$500.00	Dwelling risk	11
400.00	" "	13
400.00	" "	15
400.00	" "	17
400.00	" "	19
400.00	" "	23
500.00	" "	27
500.00	" "	29
500.00	" "	16
500.00	" "	20
500.00	" "	22
500.00	" "	24
500.00	" "	26
500.00	" "	28
550.00	" "	32
550.00	" "	34
650.00	" "	36
650.00	" "	38
550.00	" "	40
800.00	" "	44
800.00	" "	46
800.00	" "	48
700.00	" "	50
700.00	" "	52

700.00	Dwelling risk	54
400.00	" "	66
400.00	" "	71
400.00	" "	79
400.00	" "	120
400.00	" "	121

All above shown on Ravensdale Insurance Map 44-3.

The following dwellings are now non-existent and were not included in the list attached.

$300.00	Dwellings	68
300.00	"	70
300.00	"	72
300.00	"	74
550.00	"	60
300.00	"	104

(sgd) D. R. Swem

Manager of Coal Operations

DRS:lb

July 13, 1945

Mr. W. A. Lang
c/o W. A. Lang, Inc.
120 West Sixth Street
Saint Paul, Minnesota

Dear Sir:

In accordance with our telephone conversation yesterday, you have bound $15,000.00 of fire insurance coverage on our coal mine and tipple located at the plant sites at Ravensdale and vicinity, King County, Washington, to replace a like amount of coverage expiring on July 14, 1945.

As I explained to you over the telephone, this mine was taken over by the Northwestern Improvement Company effective May 1, 1945, from the Continental Coal Company. There are various other policies on this property, and policies as well on dwellings, hotel, lodging house and equipment appurtenant to the mine. We are undertaking to secure from our west end people specific details as to the property and equipment covered by each policy. When we have received this data, we will give you further advices.

At your suggestion, I am sending to you herewith the following policies on these properties which, aside from the one expiring on July 14, will expire from time to time in the future, as indicated below:

Policy No.	Insuring Company	Liability or Asset Covered	Amount of Coverage	Date Policy	Expiration date
14444	Hartford Fire Insurance Co.	Schedule	$ 15,000.	7/14/44	7/14/45
1519	St. Paul Fire & Marine	"	7,500.	9/16/44	9/16/45
6413	Hanover Fire Insurance Co.	"	16,750.	11/22/44	11/22/45
6098	American Eagle Fire Ins. Co.	"	5,750.	12/28/44	12/28/45
2774	Home Insurance Company	"	25,850.	2/ 2/45	2/ 2/46
12336	Continental Insurance Co.	"	3,500.	4/12/45	4/12/46

8/1

Saint Paul, Minnesota
July 13, 1945

Mr. J. M. Hughes
Land Commissioner

I am transmitting to you herewith a copy of a letter which I have today sent to W. A. Lang, Inc., our Insurance Agency in St. Paul, with respect to binding $15,000.00 of fire coverage to take care of the expiration tomorrow of a like amount of coverage on the Ravensdale Mine, covered under Policy No. 14444 of the Hartford Fire Insurance Company, transmitted, among others, to this office with your letter of June 18 last, file V.P. 444-1.

I have asked our Insurance people to limit the renewed insurance to fire coverage assuming that we will follow the same practice with respect to these properties as we do with regard to our Roslyn and Colstrip operation, eliminating the extended coverage feature as the policies taken out by the Continental Coal Company expire from time to time.

The statement that you have requested of Mr. Swem in your letter of July 12, a copy of which has been furnished to this office, indicating in detail the property and equipment covered by each of the policies now involved in these properties will be of considerable help to us in arranging for renewal with our Insurance people of the respective coverage as it becomes necessary to place it under our general policy.

(Signed) A. M. Gottschalk

Secretary

m/n
attach

Talked with Richardson. He to see
furnish Pres of Ravensdale key-act
for the Insurance Company.
7/17

t

6/20

NORTHWESTERN IMPROVEMENT COMPANY

St. Paul, Minn., June 11, 1945

Mr. A. M. Gottschald
Secretary

I attach hereto a statement showing the unexpired insurance on the Ravensdale mine (McKay) which the Northwestern Improvement Company took over on November 1st last, under an option to acquire the building and equipment, which option was exercised as of May 1st.

The insurance policies are now in Mr. Castagne's possession and I presume have been assigned to the Improvement Company. The question is shall we cancel and pay the short term premiums that will be due and place the coverage with the Lang Agency, or shall we continue the policies until they expire. Will you please have this matter looked into and advise me what will be the proper procedure.

J. M. Hughes

Vice President

JMH:C

Att.

cc-Mr. D. R. Swem

Mr. J.J.Castagne

Talked to Mr Hughes. He will ask Castagne to send in policies for study.
Wm 6/13

Cmj 6/14/45

paid policy expires July 14 78567

7/5

Saint Paul, Minnesota
June 22, 1945

C
O
P
Y

Mr. J. M. Hughes
Land Commissioner

Referring to your letter of June 18, file V. P. 444-1, enclosing unexpired insurance policies on the Ravensdale mine properties now owned by the Northwestern Improvement Company:

There is no reason, from our standpoint, why the policies should not be continued in effect, and it will be in order to refund to Continental Coal Company their proportion of premiums for the unexpired terms of the policies.

The only question now to be determined is whether or not the amount of coverage is sufficient or otherwise. Furthermore, we will, as the above mentioned policies expire, arrange to include with schedule covering other Northwestern Improvement Company properties. We have recorded and will retain the policies in our custody.

(Signed) A. M. Gottschald

Secretary

6/27/45

g/n

NT CO.

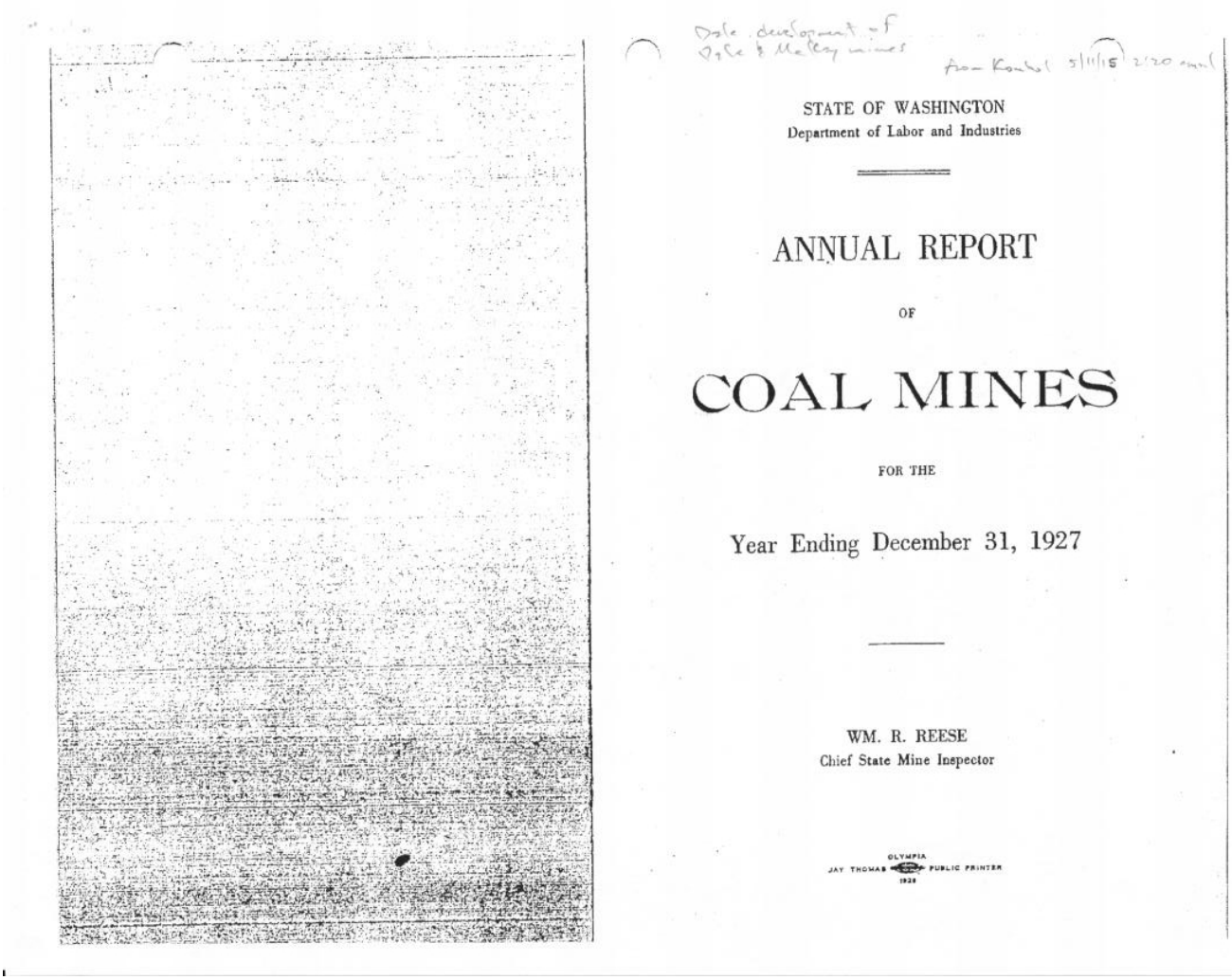
Expiration Date	Total Premium	Days to Run after 4/30/45	Chargeable to NWI Co.
7/14/45	233.31	75	47.94
9/16/45	116.63	139	44.41
11/22/45	260.45	206	146.99
12/26/45	89.41	242	59.26
2/2/46	401.98	278	306.17
4/12/46	57.12	347	54.30
7/17/46 (3 yr.)	338.80	78 (1 yr.)	137.07
4/17/48 (3 yr.)	296.64	352 (2 yr.)	293.12
5/1/46	381.88	365	381.88

TOTAL CHARGE TO NORTHWESTERN IMPROVEMENT COMPANY 1,471.16

7802	American Eagle Fire Ins. Co.	Schedule	23,400.00	5/1/45	

THE CONTINENTAL COAL CO.
SPOKANE, WASHINGTON

15e-05 **Development Dale Mines, 1927 Mine Inspector Rpt**



Dale development of Dale & Malloy mines

Ann Kunkel 5/11/15 2120 email

STATE OF WASHINGTON
Department of Labor and Industries

ANNUAL REPORT

OF

COAL MINES

FOR THE

Year Ending December 31, 1927

WM. R. REESE
Chief State Mine Inspector

OLYMPIA
JAY THOMAS PUBLIC PRINTER
1928

NAME, ADDRESS AND NUMBER OF CERTIFICATE OF THOSE WHO PASSED FIRST AND SECOND CLASS EXAMINATION

FIRST CLASS	Post Office Address	No. of Certificate
J. M. Rogers	Enumclaw, King County	1
John R. Lewis	Roslyn, Kittitas County	2
W. A. Morrison	Kopiah, Lewis County	3
George W. Sheatsley	Kopiah, Lewis County	4
Ben F. Snooks	Carbonado, Pierce County	5

SECOND CLASS	Post Office Address	No. of Certificate
John T. Birtchell	Roslyn, Kittitas County	1
A. E. Kirkbride	Black Diamond, King County	2
Edward Rushton	Roslyn, Kittitas County	3
Robert S. Brown	Cle Elum, Kittitas County	4
John E. Pasquan	Roslyn, Kittitas County	5
John Krenk	Roslyn, Kittitas County	6
Alex McLean	Roslyn, Kittitas County	7
Thomas Woodward	Roslyn, Kittitas County	8
Stanley Wightman	Roslyn, Kittitas County	9
Stanley Murphy	Roslyn, Kittitas County	10
George T. Wake, Jr.	Seattle, King County	11
John Woods	Roslyn, Kittitas County	12
W. N. Roberick	Newcastle, King County	13

NEW EQUIPMENT AND DEVELOPMENT WORK FOR THE YEAR 1927

KING COUNTY

The Carbon Clay and Coal Co.

Has driven 70 feet gangway and reopened airway from 3rd level to surface.

The Caroline Coal Co.

Has driven 728 feet gangway. Installed a Hartford Blower fan. Installed an air compressor and constructed a cleaning and separating coal washery, all electrically driven and lighted.

The Dale Coal Co. (Ravensdale)

Has driven 630 feet gangway at the Dale mine, 540 feet slope on the McKay seam and 237 feet airway on same. A tramway has been constructed from the Dale tipple over a mile long with electric motor installed to handle and transport the McKay coal to washery. Permanent hoisting machinery has been installed on this slope. A fan has been installed to ventilate the McKay workings. Washery and tipple with Elmore Washers, shaking screens, picking tables, revolving screens and loading boom. A complete briqueting plant has been constructed and is operating in conjunction. Blacksmith and machine shops have been erected and equipped with suitable machinery. Superintendent's and accountant's offices have been built. A 1000 gal. p. m. electric pump has been installed to deliver the necessary supply of water from a nearby lake to the washery and a 15,000 cu. ft. (air) p. m. Jeffrey Fan has been installed at the Dale openings. Electric haulage system has supplanted mule haulage in the mine. Railroad tracks have been laid for shipping directly to the N. P. Ry. with adequate trackage to handle the coal output and briquets manufactured at the plant. The installation and developments made at this operation are promising of a good output for the coming year.

Harris Coal Co.

Has driven 184 feet gangway in the course of the year.

Morris Bros. Coal Co.

Has driven 550 feet of gangway. This company has done some prospecting on their No. 3 seam and possibly during the coming year will develop that part of the property.

W. G. Kegler Coal Co.

Navy mine, Cumberland, has re-opened its old water level tunnel onto the Navy seam and has driven 295 feet of gangway on the top coal of that seam, operation on which had heretofore been confined to the bottom bench. 814 feet of chutes and 750 feet cross-cuts also have been driven. An air chute is being driven to the surface for ventilation. After this is complete it is proposed to continue tunnel already driven, 350 feet, crossing the measures to intersect what is supposed to be the carbon seam. It is estimated a strike or range of 4500 will be had on this seam after it is tapped within property lines on water level. An electric driven 5 foot fan has been installed to ventilate the workings, and bunkers rearranged to handle the product. This company has acquired the Eureka mine property and operation now going on will extend into and thru that property.

Parkin-Kangley Coal Co.

On the 1st of November this company acquired the operations of the Carbon Clay & Coal Company's mine at Bayne. The old carbon seam slope was dewatered and 124 feet of gangway driven on the seam. A single stage Moran Centrifugal pump and an electric hoist has been installed in the mine for hoisting and drainage preparatory to continuing the slope through the dyke traversing this section of the property.

The Parkins-Kangley Coal Co. operating the Kangley mine has driven 410 feet of gangway and 220 feet of slope during the year. Operations ceased at this mine during August; the mine was abandoned and plant dismantled.

Pacific Coast Coal Co. (New Black Diamond Mine)

Has driven 1690 feet of gangway and 640 feet of slope. A new Rheolavenr washery has been installed to prepare the coal for market. This is the first Rheolavenr washery installed in the state and reports are that its operations are efficient and satisfactory. The chief advantages claimed for this washery are, first, increased yield of marketable coal with greater proportion of large sizes; Second, low installation and operating cost; Third, high recovery with maximum refuse removal; Fourth, dependable operation with definite control; Fifth, feed with high and variable refuse contents efficiently washed, and Sixth, make-up water requirements very low.

A new and commodious wash-house with modern shower baths, drying facilities and other conveniences has been built, also, machine and blacksmith shops, lamp house and office accommodations have been constructed at this plant during the year. A refuse aerial cable tramway has been