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March 12, 2020

Dustin Czapla
Colorado Department of Natural Resources
Division of Reclamation, Mining & Safety
1313 Sherman Street, Room 215
Denver, CO 80203
303-866-3567

Delivered Via Email and Fedex Hard Copy

RE: Pride of America Mine, Colorado Stone Quarries, M-1999-058, Technical Revision - 6 to Modify Fuel Location at the Pride of America Mine, Adequacy Response 1

Dear Mr. Czapla:

Please see the following responses to the adequacy review comments set forth in your letter to me dated March 2, 2020.

1. In order to ensure ongoing protection of nearby Yule Creek, please commit to conducting monthly water sampling at the sump located downgradient from the fuel storage area, adjacent to Yule Creek. Samples should be analyzed for diesel and BTEX constituents. The water quality sampling results shall be submitted to the Division each year as an attachment to the annual report. If elevated levels are noted in any of the monthly samples the Division shall be notified immediately in order to determine an appropriate course of action for mitigation.

Response No. 1. Water sampling of the sump will be conducted in accordance with CSQ's Groundwater Sampling & Analysis Plan, dated March 12, 2020, and prepared by HRL Compliance Solutions, Inc. (HRL) (the Groundwater Plan). A copy is enclosed. As noted in the Groundwater Plan, samples will be analyzed for diesel and BTEX constituents. Monthly sampling of the sump groundwater monitoring well is planned for a 12-month period (January – December 2020) with the three (3) additional groundwater wells being sampled monthly for the remainder of 2020 once they are installed and developed. Sampling results will be submitted to the Division as an attachment to the annual report. The most recent sampling results dated March 6, 2020 are enclosed. In the event concentrations of diesel or BTEX constituents exceed applicable CDPHE thresholds, the Division will be promptly notified so that CSQ and its consultants and the Division can discuss the sampling results

and whether any response actions are required.

In addition to groundwater monitoring, surface water quality samples will be collected at various locations on Yule Creek as part of CSQ's overall water quality monitoring program. The surface water sampling will be conducted in accordance with the enclosed Surface Water Sampling & Analysis Plan, dated March 12, 2020, which was prepared by HRL.

2. Please provide a plan for how the operator will handle and dispose of precipitation that will be captured in the containment structure.

Response 2. CSQ anticipates that, as necessary to maintain appropriate retention capacity, precipitation collected in the containment structure for the stationary fuel tanks and gensets will be periodically pumped into a vacuum truck and hauled offsite to an approved wastewater treatment facility, such as, but not limited to, Greenleaf Environmental Service's facility located in DeBeque, CO. An operating procedure for such water disposal is in process and will be shared with the Division once it is finalized.

3. Please acknowledge that approval of TR-06 will be based on the position of Yule Creek in its present "diverted" channel. Should Yule Creek be returned to its previous channel additional protection and/or monitoring measures may be required.

Response No. 3. CSQ understands and acknowledges that DRMS' approval of TR-06 will be based on the assumption that Yule Creek will remain in its present "diverted" channel and that, should Yule Creek be returned to its previous channel, additional actions/measures may be required.

Please do not hesitate to contact me if you have any questions.

Regards,

Katie Todt, P.G.
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katie@lewicki.biz

CC: Daniele Treves, Colorado Stone Quarries; Ben Miller, GLA; David Baumgartner, Gunnison County Attorney

Enclosures:
- Colorado Stone Quarries - Diesel Spill - Groundwater Sampling and Analysis Plan

- (Final 3.12.20).pdf
- Colorado Stone Quarries - Master Data Tracker 3.6.20.xlsx
- Colorado Stone Quarries - Diesel Spill - Surface Water Sampling and Analysis Plan - (Final 3.12.20).pdf

COLORADO STONE QUARRIES

MARBLE QUARRY DIESEL SPILL

GROUNDWATER SAMPLING & ANALYSIS PLAN

Gunnison County, CO

March 12, 2020

HRL COMPLIANCE SOLUTIONS

Prepared by:
HRL Compliance Solutions, Inc.
2385 F ½ Road
Grand Junction, CO 81505

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I. Purpose and Scope

This plan ("Plan") outlines the groundwater monitoring well installation and sampling that will occur at the Colorado Stone Quarries (CSQ) Marble Mine to monitor groundwater for hydrocarbon constituents associated with the October 11, 2019 diesel fuel spill. The spill released approximately 5,500 gallons of diesel to the fill material near Portal 4 as a result of an accidental overfill of a generator day tank.

On October 16, 2019, Colorado Stone Quarries (CSQ) reported to the Colorado Division of Reclamation, Mining and Safety (DRMS) and the Colorado Department of Public Health & Environment (CDPHE) that a diesel fuel release occurred on October 11, 2019 from an above-ground storage tank which impacted the underlying fill material below the tank and an associated generator. CSQ personnel discovered diesel fuel daylighting within a sump, approximately 1,200 feet downgradient from the release point. CDPHE issued a release spill tracking # 2019-0587 and noted that the DRMS will be the lead agency on monitoring the remediation.

HRL Compliance Solutions Inc. (HRL) was contracted on October 23, 2019 to perform an initial onsite inspection and evaluate the impacted area to provide support for initial clean-up in conjunction with remediation, sampling, waste management and monitoring support.

The following information provides details regarding the groundwater monitoring well installation, development, and sampling & analysis of the groundwater within and/or below CSQ's road fill material. This plan is designed to outline the frequency of sampling, sampling and analytical procedures, and contingency plans should detections above the regulatory thresholds be observed. It should be noted that changes in the nature and scope of this project may directly affect the specifics of this plan.

II. Plan Applicability

This plan is applicable to groundwater monitoring at the CSQ quarry within the former channel of Yule Creek. A total of four (4) groundwater monitoring wells are proposed; one will be installed upgradient from the release point and two will be installed downgradient of the release point. The fourth monitoring well, which has already been installed within the sump basin on November 15, 2019, is located approximately 1,200 feet from the release point. (See Figure 1)

It should be noted that the sampling and analysis components of this Plan are currently being implemented for the sump well to monitor groundwater quality in the sump area. The other three wells (MW 1 – 3) located between the sump and the point of release have not yet been installed. MW 1-3 were initially planned for installation during late December 2019 or early January 2020. However, due to equipment failure, winter weather, freezing of the subsurface soils, and snow accumulation preventing access, installation of MW 1-3 was postponed until the Spring/Summer 2020.

III. Monitoring Well Installation

A groundwater monitoring well installation Notice of Intent (NOI) was submitted to the Colorado State Engineer's Office on November 12, 2019, satisfying the required 72-hour notice before installation was completed. The NOI is valid for a period of 90 days from the time of submittal. Therefore, due to the delay in installation of MW 1-3 a new NOI will need to be submitted as the previous one will have expired.

A. Groundwater Wells

During the spring/summer of 2020, three (3) groundwater monitoring wells will be installed to a depth of approximately 50-60ft, where the previous Yule Creek channel flowed as depicted in Figure 1.

- MW 1 is located approximately 225ft above the point of release and is intended to serve as an upgradient background monitoring well,
- MW 2 is located at approximately 250ft downgradient from the spill area, and
- MW 3 is located approximately 750ft downgradient from the spill area,

Figure 1 depicts the approximate locations of the wells; however, actual locations of the wells may change depending on site layout and subsurface soil conditions.

The monitoring wells will be constructed with 2" schedule 40 PVC with approximately 40-50ft of solid PVC riser and the bottom 5-10ft consisting of 10-slot perforated screen. Once the PVC is installed, pea-gravel will be utilized to backfill around the screened interval to allow for groundwater to flow. Backfill above the screened interval around the solid PVC riser may consist of road-base fill, native soil from the surrounding area, and blasting material stockpiled at the quarry as long as it does not contain rocks larger than 2 ". Refer to Figure 2 for a diagram of the groundwater monitoring well installation.

Once backfilled, the 2" PVC riser will extend above ground approximately 2-3ft and will be capped with a J-Plug or threaded plug to prevent precipitation and any foreign material from entering the well and locked for security. As outlined in the top view of Figure 2, marble blocks will be placed around the well to ensure integrity of the well and prevent damage from surface activities.

Development of the groundwater monitoring wells will be completed by utilized a submersible pump designed to remove sediment or a steel submersible bailer. A minimum of 3 casing volumes will be purged from each well.

B. Sump Well

A 4" PVC groundwater monitoring well was installed on November 15, 2019 within the sump area after it had been reinforced with marble blocks on the downgradient side and backfilled 10-12ft. Marble blocks were also placed around a small area of the backfilled sump area that had been left open to allow for groundwater monitoring and to provide protection to the well from settling/shifting soils or large snow accumulation and movement.

The well was installed to a depth of 15 feet below the current ground surface of the sump basin, with 10ft of solid 4" PVC riser and 5ft of 4" slotted PVC extending below the water table. Pea-gravel was placed around the slotted PVC to provide stabilization and allow for groundwater flow.

Development of the sump groundwater monitoring well consisted of purging water utilizing a stainless-steel bailer until the water indicated that sediment had been removed. A 4-inch J-Plug was placed in the top of the PVC riser, to prevent precipitation and foreign material from entering the well.

IV. Sampling Schedule

A. Winter Sample Schedule

During the winter/spring months, all three groundwater monitoring wells and the sump well will be sampled on a monthly basis as long as safe access is possible. If site conditions at any of the groundwater monitoring wells prevent safe access, sampling of that well will not be conducted at that time and either re-scheduled or postponed until the following month.

To access the sample locations during the winter months, sampling personnel may utilize some of, but are not limited to, the following equipment, in additional to their regular required PPE, to ensure safe sampling procedures are being followed:

- Snowshoes
- Avalanche location beacon
- Microspike footwear traction
- Ladder / Tether

If snowpack volumes accumulate to the point where the monitoring wells are inaccessible, notice will be provided to the DRMS and sampling will cease until access can be re-evaluated and deemed safe for personnel to resume sampling activities.

B. Summer Sampling Schedule

During the summer and early fall months, or when normal access is feasible, samples from the groundwater monitoring wells will occur on a monthly basis at all three (3) monitoring wells and the sump well.

It may be necessary to conduct bi-monthly (2x per month) sampling of individual monitoring wells if significant changes to groundwater quality conditions are observed between sampling events, large fluctuations in water levels due to seasonal runoff, or changes to the treatment/remediation plans.

Equipment used to access the sample locations may consist of, but is not limited to, the following:

- Waterproof / resistant clothing & PPE
- Microspike footwear traction
- Ladder / Tether

C. Compromised/Damaged/Dry Wells

Should the integrity of a well be compromised by subsurface movement or other damage that prevents sampling from occurring, the well will either be plugged and abandoned in accordance with Colorado Division of Water Resources (CDWR) (also known as the Office of the State Engineer or the State Engineer's Office) requirements and a new one installed, or the monitoring of the groundwater in that area will be re-evaluated.

If a well does not yield a measurable amount of water due to seasonal groundwater fluctuations (drought, low flow, etc.), sampling of that well will be postponed until a measurable amount of water is observed.

Any material changes to the groundwater sampling schedule or integrity of the monitoring wells will be reported to the DRMS.

V. Sampling Procedures

All samples will be collected by individuals experienced with water quality sampling and sent to a laboratory accredited by the National Environmental Laboratory Accreditation Program (NELAP). Sampling personnel will ensure the following procedures are followed at each sample location.

A. Container Prep

New, unused sample containers required by the lab for the specified analysis will be obtained the week before sampling is scheduled to ensure preservation volumes within the containers meet laboratory specifications.

Sample containers will consist of the following:

- (6) 40 ml clear glass vials preserved with HCL
- (2) 125 ml amber glass jars (no preservative)
- (1) 500 ml poly jar (no preservative)

B. Equipment Prep

To reduce the risk of cross contamination, sampling personnel will ensure new, unused nitrile gloves are used during each sampling event, which includes changing gloves between each sample location. Utilizing nitrile gloves will also ensure that acid preservation within the sample bottles do not come in contact with the sampler's hand/skin.

All sampling equipment (bailer, submersible pump, water level indicator, peristaltic pump, etc.) will be properly decontaminated between sample locations. Single use sampling equipment, such as poly submersible bailer and rope will be discarded after the sample usage for that well.

- Sample Coolers – All coolers will contain the necessary volume of ice to preserve sample containers to 4° F and each cooler will contain a temperature and trip blank to accompany the samples to the lab.
- Water Level Indicator - A 200ft water level indicator will be utilized to obtain water level measurements before each sampling event.
- Submersible pump – A GeoSub SS submersible pump with a flow controller and polyethylene tubing will be utilized to purge the monitoring well the necessary casing volume and obtain the necessary sample.
- Water Quality Meter - All water quality readings will be collected utilizing a YSI 556 MPS water quality meter.

Equipment will be calibrated prior to use to ensure accuracy of readings collected. Field parameters will be recorded on a groundwater field data sheet and retained for trend analysis. If conditions

(freezing, fast runoff, presence of free phase product, etc.) are present, then field parameters may not be collected as these conditions can be detrimental to the field parameter unit.

C. Purging

Each of the groundwater monitoring wells will be purged by pumping 3-casing volumes prior to sample collection to ensure that an accurate representation of the groundwater is obtained. All purge water will be collected in a clean 5-gallon poly bucket and evaluated for contamination. If the purge water is believed to be impacted by hydrocarbons, it will be properly contained and disposed of at an approved and permitted disposal facility.

If during the purge process, water levels drop or a well does not recharge (runs dry), personnel will continue on to the subsequent wells for purging and sampling and revisit the well at the end of the day. If the well has still not recharged at that time, the well will be allowed to recharge for a 24-hour period and resampled the following day without purging.

D. Sample Collection

Samples will be collected from the polyethylene tubing connected to the submersible pump from each of the monitoring wells.

Containers requiring zero headspace will be checked to ensure that no bubbles are present exceeding the laboratory specifications. If a bubble is observed, the sample will be retained and remain within the container as it contains an acid preservation. However, a second container will be filled to fulfill the laboratory container requirements. Both samples will be submitted to the lab for proper management.

VI. Sampling Analysis

Each monitoring well sample will be submitted for the following analysis;

- Diesel Range Organics (DRO) — Method 8015C
- Gasoline Range Organics (GRO) — Method 8015D
- Poly-Aromatic Hydrocarbons (PAH) — Method 846 8270D
- Benzene, Toluene, Ethylbenzene, Total Xylenes (BTEX) — Method 8260C

Additional analysis will be added as requested by regulatory agencies or as needed to evaluate other parameters of water quality.

Samples will be submitted to Pace Analytical Laboratories (Pace). Analysis will be requested on a standard five (5) business day turn, unless rush analysis is required, at which time 24-hour reporting will be requested from the lab. Should Pace be unable to meet the demands of the project, an alternate NELAP lab will be identified and approved by personnel overseeing this project and the applicable regulatory agency(ies) before utilization.

VII. Conclusion

The information above is designed to outline the sampling procedures and processes to evaluate the groundwater quality at the CSQ Marble Quarry and the subsurface hydrocarbon contamination associated with the diesel release.

As outlined in this Plan, monthly sampling of the sump groundwater monitoring well is planned for a 12-month period (January – December 2020) with the three (3) additional groundwater wells being sampled monthly for the remainder of 2020 once they are installed and developed.

A summary of the groundwater data will be compiled into an annual report. In the event the timeline of sampling and monitoring is materially revised as a results of data results obtained throughout 2020 or for other reasons, the DRMS (and other regulatory agencies, as applicable) will be so advised.

If changes occur to the site and project, alterations to this plan may be required. This document is intended to be a living document and any revisions will be noted on the cover page with the revision date and provided to the DRMS (and other regulatory agencies, as applicable) for approval.

FIGURE 1

Groundwater Well Location Map

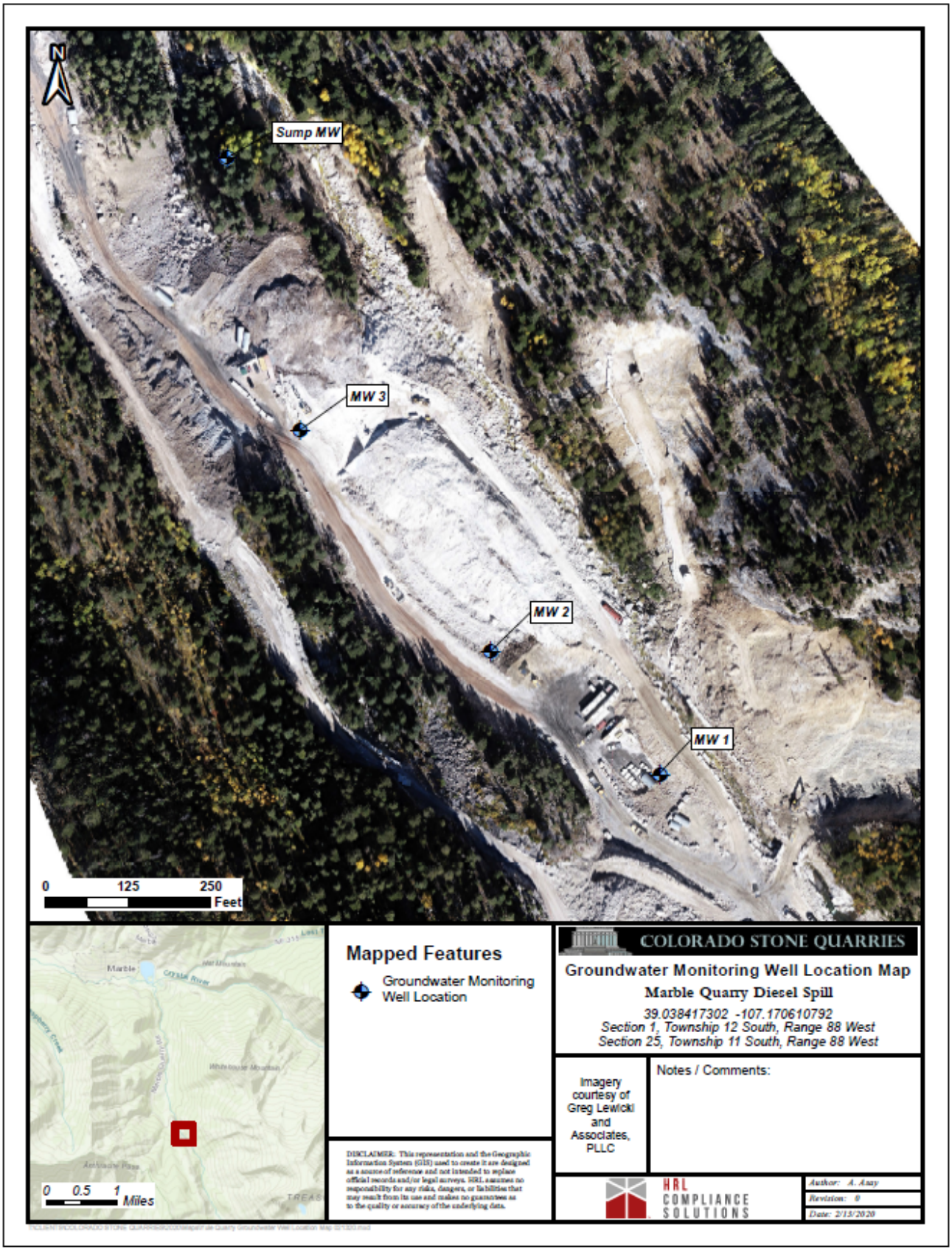
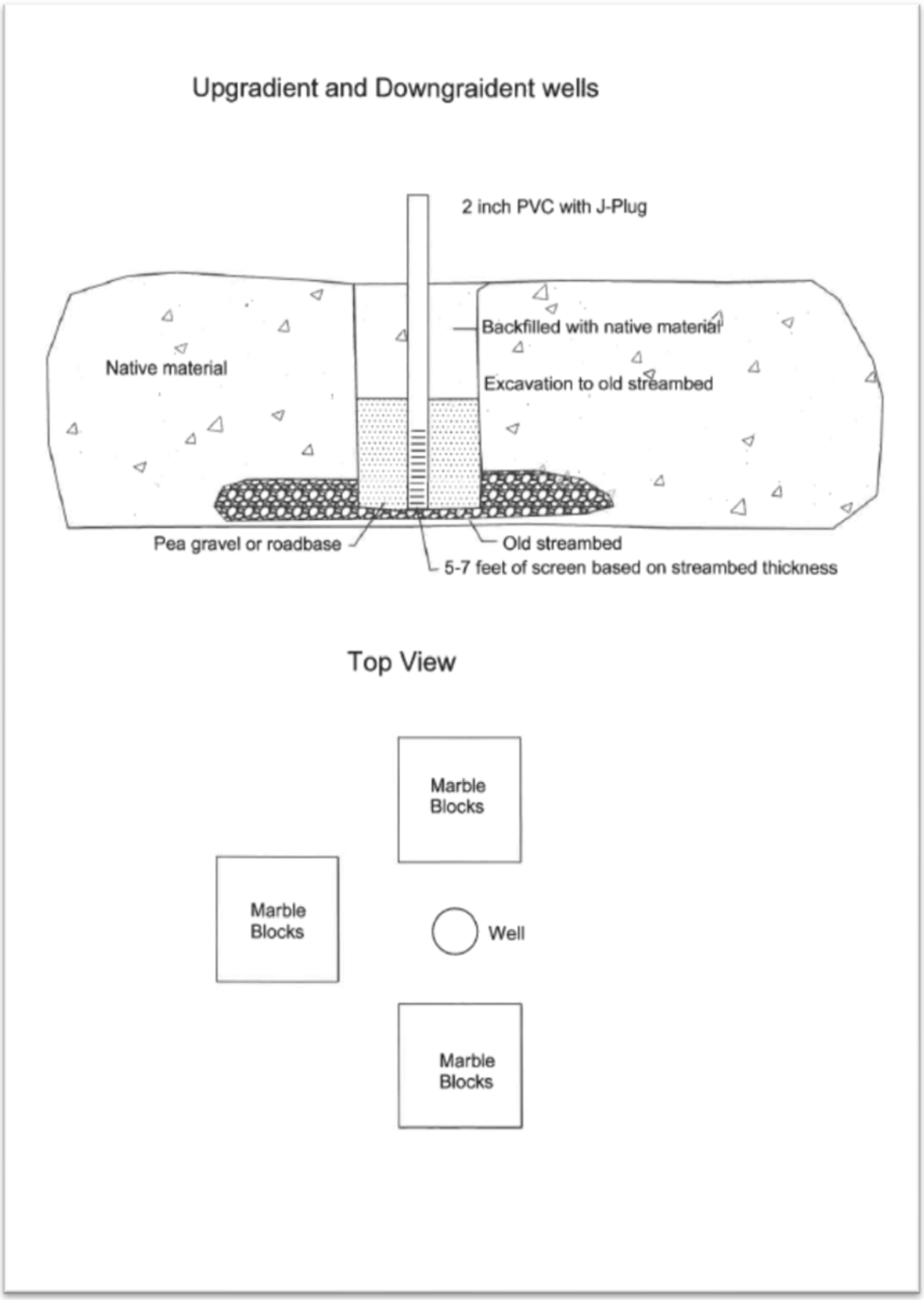


FIGURE 2

Groundwater Well Install Diagram



COLORADO STONE QUARRIES

MARBLE QUARRY DIESEL SPILL

SURFACE WATER SAMPLING & ANALYSIS PLAN

Gunnison County, CO

March 12, 2020

HRL COMPLIANCE SOLUTIONS

Prepared by:
HRL Compliance Solutions, Inc.
2385 F ½ Road
Grand Junction, CO 81505

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FIGURES

I. Purpose and Scope

This plan outlines the surface water sampling and analysis that will be conducted to monitor the water quality in Yule Creek and other surface water sampling locations associated with the October 2019 diesel fuel spill. That spill released approximately 5,500 gallons of diesel to road fill material near Portal 4 as a result of an accidental overfill of a generator day tank.

On October 16, 2019 Colorado Stone Quarries (CSQ) reported to the Department of Reclamation and Mining Safety (DRMS) and Colorado Department of Public Health and Environment (CDPHE) that a diesel fuel release occurred on October 11, 2019 from an above ground storage tank which impacted the underlying fill material below the tank and an associated generator. CSQ personnel discovered diesel fuel daylighting within a sump, approximately 1,200 feet downgradient from the release point. CDPHE issued a release spill tracking # 2019-0587 and noted that the DRMS will be the lead agency on monitoring the remediation.

HRL Compliance Solutions Inc. (HRL) was contracted on October 23, 2019 to perform an initial onsite inspection and evaluate the impacted area to provide support for initial clean-up in conjunction with remediation, sampling, waste management and monitoring support.

The following information provides details of the surface water sampling on Yule Creek, outlining the frequency, sample procedures, analysis and contingency plans should detections above the regulatory threshold be observed. It should be noted that changes in the project and scope may directly affect the specifics of this surface water sampling & monitoring plan.

II. Plan Applicability

This plan is applicable to the surface water monitoring on Yule Creek and any other associated surface water sampling and/or monitoring that may be incorporated after the date of this plan. This plan is intended to ensure that all surface water samples collected as of January 2020 are sampled in accordance with this plan and documented properly. For specifics regarding groundwater sampling and monitoring, please refer to CSQ's "Groundwater Sampling & Monitoring Plan."

Ongoing surface water sampling of Yule Creek will be conducted at previously established sample locations along Yule Creek to monitor for the presence of hydrocarbons associated with the October 2019 diesel release. Sample locations will vary during the winter months as access is limited or entirely inaccessible due to snowpack.

III. Sampling Locations

Upon discovery of the release, the following surface water sample locations have been established on Yule Creek;

A. Upgradient (UG 1)
   A sample point has been established upgradient from the point of release to serve as a background sample for comparison to current water quality conditions in Yule Creek.

B. Cross Gradient (CG 1)
   A sample point immediately cross gradient from where the release occurred has been established to monitor if any cross-gradient movement of hydrocarbon impacts are occurring.

C. Downgradient #1 (DG 1)
The first downgradient sample point is a mid-point on Yule Creek, approximately halfway between the point of release and where the release was observed daylighting.

D. Downgradient #2 (DG 2)
The second downgradient sample point is located on Yule Creek cross-gradient from the sump area where the release daylighted.

E. Downgradient #3 (DG 3)
The third downgradient sample point is located approximately 110 feet below the sump basin, within the discharge path where pooling occurred. DG 3 is currently a confluence point of the sump discharge path and Yule Creek.

F. Downgradient #4 (DG 4)
The fourth downgradient point is located on Yule Creek at a distance of approximately 408 feet from the sump basin.

G. Downgradient #5 (DG 5)
The furthest downgradient point is located on Yule Creek at a distance of approximately 790 feet from the sump basin.

H. Confluence Point
The confluence point is where Yule Creek and the Crystal River (including water features supplied by the Crystal River) meet. The sample point is located approximately 100-150 feet upstream from where Yule Creek discharges into a wetland area that is influenced by the Crystal River.

It should be noted that DG 3 was established during a period of low flow. The actual confluence point of the discharge water from the sump basin and Yule Creek may change with the varying water levels, thereby requiring DG 3 to move as the sump basin to Yule Creek confluence point changes.

IV. Sampling Schedule

A. Winter Sample Schedule

During the winter months when snow accumulations prevent personnel from safely accessing sample locations and where the underlying ground support or terrain cannot be determined, surface water sample collection will be limited to the following locations, access dependent:

- UG 1
- DG 3
- DG 4
- Confluence

In addition, some sample locations on Yule Creek may require an alternate route of access due to snow accumulation or water levels. This may require access through private property, which will be dependent on landowner authorization.

To access the sample locations during the winter months, sampling personnel may utilize some of, but not limited to, the following equipment in additional to their regular required PPE to ensure safe sampling procedures are being followed:

- Snowshoes
- Avalanche location beacon
- Microspike footwear traction
- Ladder / Tether
- Snowmobile / Snow Machine

If snowpack volumes accumulate to the point where Yule Creek is inaccessible, notice will be provided to the DRMS and sampling will cease until access can be re-evaluated and deemed safe for personnel to resume sampling activities.

DG 5 is located within an avalanche zone and will only be sampled if detections at DG 3 and DG 4 indicate a hydrocarbon presence exceeding regulatory thresholds.

B. Summer Sampling Schedule

During the summer and early fall months, or when normal access is feasible, samples from the following locations will occur monthly:

- UG 1
- DG 3
- DG 4
- Confluence

Equipment used to access the sample locations may consist of, but not be limited to, the following:

- Waterproof / resistant clothing & PPE
- Microspike footwear traction
- Ladder / Tether

C. Quarterly/Contingent Sampling

CG, DG 1 and DG 2 will be sampled quarterly to monitor water quality parameters on Yule Creek upgradient from the sump. If analytical results indicate that water quality parameters have changed and diesel related contaminants are detected at DG 3, sample locations (CG, DG 1, DG 2) will be included in the monthly sampling and monitoring to evaluate potential lateral movement of hydrocarbon impacts

DG 5 is an additional sample location which will be sampled contingent on the water quality parameters at DG 3 and DG 4. If contaminants of concern (COC's) are detected in DG 3 and DG 4 at

or above regulatory thresholds, sampling at DG 5 will be included in the monthly sampling and monitoring to provide additional water quality data in Yule Creek.

Additional sample locations may be added as needed to aid in the monitoring of water quality in Yule Creek. Changes to the sampling schedule, frequency and/or locations will be reported to the DRMS.

V. Sampling Procedures

All samples will be collected by individuals experienced with water quality sampling and sent to a laboratory accredited by the National Environmental Laboratory Accreditation Program (NELAP). Sampling personnel will ensure the following procedures are followed at each sample location.

A. Container Prep

New un-used sample containers required by the lab for the specified analysis will be obtained the week before sampling is scheduled to ensure preservation volumes within the containers meet laboratory specifications.

Sample containers will consist of the following:

- (6) 40 ml clear glass vials preserved with HCL
- (2) 125 ml amber glass jars (no preservative)
- (1) 500 ml poly (no preservative)

B. Equipment Prep

To reduce the risk of cross contamination, sampling personnel will ensure new un-used nitrile gloves are used during each sampling event, which includes changing gloves between each sample location. Utilizing nitrile gloves will also ensure that acid preservation within the sample bottles do not come in contact with the sampler's hand/skin.

All sampling equipment (extension pole, dip rod, peristaltic pump, etc.) will be properly decontaminated between sample locations. Single use sampling equipment, such as poly jars utilized to capture low flow volumes will be triple rinsed with the water to be sampled prior to collection and transfer. All single use containers will be discarded after each use.

Sample coolers will contain the necessary volume of ice to preserve sample containers to 4° F and each cooler will contain a temperature and trip blank to accompany the samples to the lab.

In-stream flow meter readings will be collected at each sample location utilizing a Global Water Flow Probe (Model FP101) and will record the average and max flow volumes in ft/sec. In instances where a sampling extension pole is needed to collect a sample due to high flow volumes, ice danger, or other unforeseen circumstances, flow volumes will not be recorded for that sample location.

All water quality readings will be collected utilizing a YSI 556 MPS water quality meter. Equipment will be calibrated prior to use to ensure accuracy of readings collected. Field parameters will be recorded on a surface water data sheet and transferred to a master tracking spreadsheet for trend analysis. If conditions (freezing, fast runoff, presence of free phase product, etc.) are present, then

field parameters may not be collected as these conditions can be detrimental to the field parameter unit.

C. Sample Collection

Samples will be collected directly from the surface water at the same locations mentioned above. A new un-used poly container included in the sample kit will be triple rinsed and utilized to transfer the surface water to sample containers that contain a preservative. When transferring water to the smaller containers, special precaution will be taken to prevent overfilling and diluting the container preservation.

Containers requiring zero headspace will be checked to ensure that no bubbles are present exceeding the laboratory specifications. If a bubble is observed, the sample will be retained and remain within the container as it contains an acid preservation. However, a second container will be filled to fulfill the laboratory container requirements. Both samples will be submitted to the lab for proper management.

VI. Sampling Analysis

After a baseline of analysis that was established through the investigation process, sampling and analysis of each sample location will consist of the following constituents;

- Diesel Range Organics (DRO) Method 8015C
- Gasoline Range Organics (GRO) Method 8015D
- Poly-Aromatic Hydrocarbons (PAH) Method 846 8270D
- Benzene, Toluene, Ethylbenzene, Total Xylenes (BTEX) Method 8260C

Additional analysis will be added as requested by regulatory agencies or as needed to evaluate other parameters of water quality.

Samples will be submitted to ALS Global, USA. All samples will be on a standard five (5) business day turn, unless rush analysis is required, at which time 24-hour reporting will be requested from the lab. Should ALS be unable to meet the demands of the project, an alternate NELAP lab will be identified and approved by personnel assisting with this project and regulatory agencies before utilization.

VII. Conclusion

The information above is designed to outline the sampling procedures and processes to monitor the water quality in Yule Creek and ensure no impacts are occurring downgradient of the spill area exceeding regulatory thresholds. Monthly sampling of Yule Creek is planned for a 12-month period (January – December 2020), allowing for a full year of analysis and monitoring covering all the seasonal water fluctuations. When 12 months of sampling is complete, a summary of the surface water data will be compiled into an annual report. Should contaminant concentrations remain below regulatory threshold limits for a 12-month period, sampling frequency will be reduced to quarterly. Quarterly sampling will continue until four consecutive (4) quarters of data are below regulatory thresholds.

If changes occur to the site and project, alterations to this plan may be required. This document is intended to be a living document and any revisions will be noted on the cover page with the revision date and provided to the regulatory agencies for approval.

FIGURE 1

Surface Water Sample Location Map

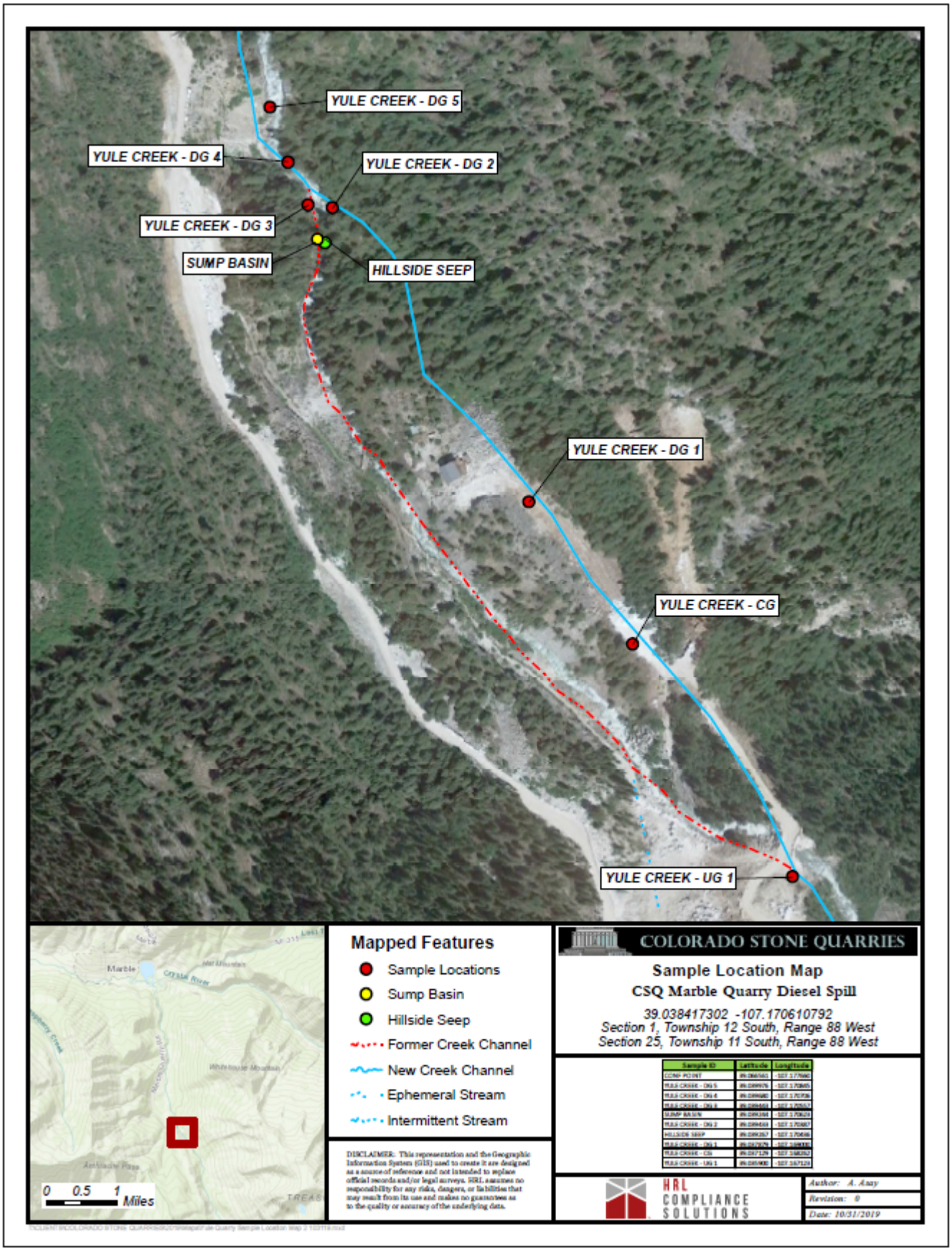


FIGURE 2

Surface Water Sample Location Map – Overview

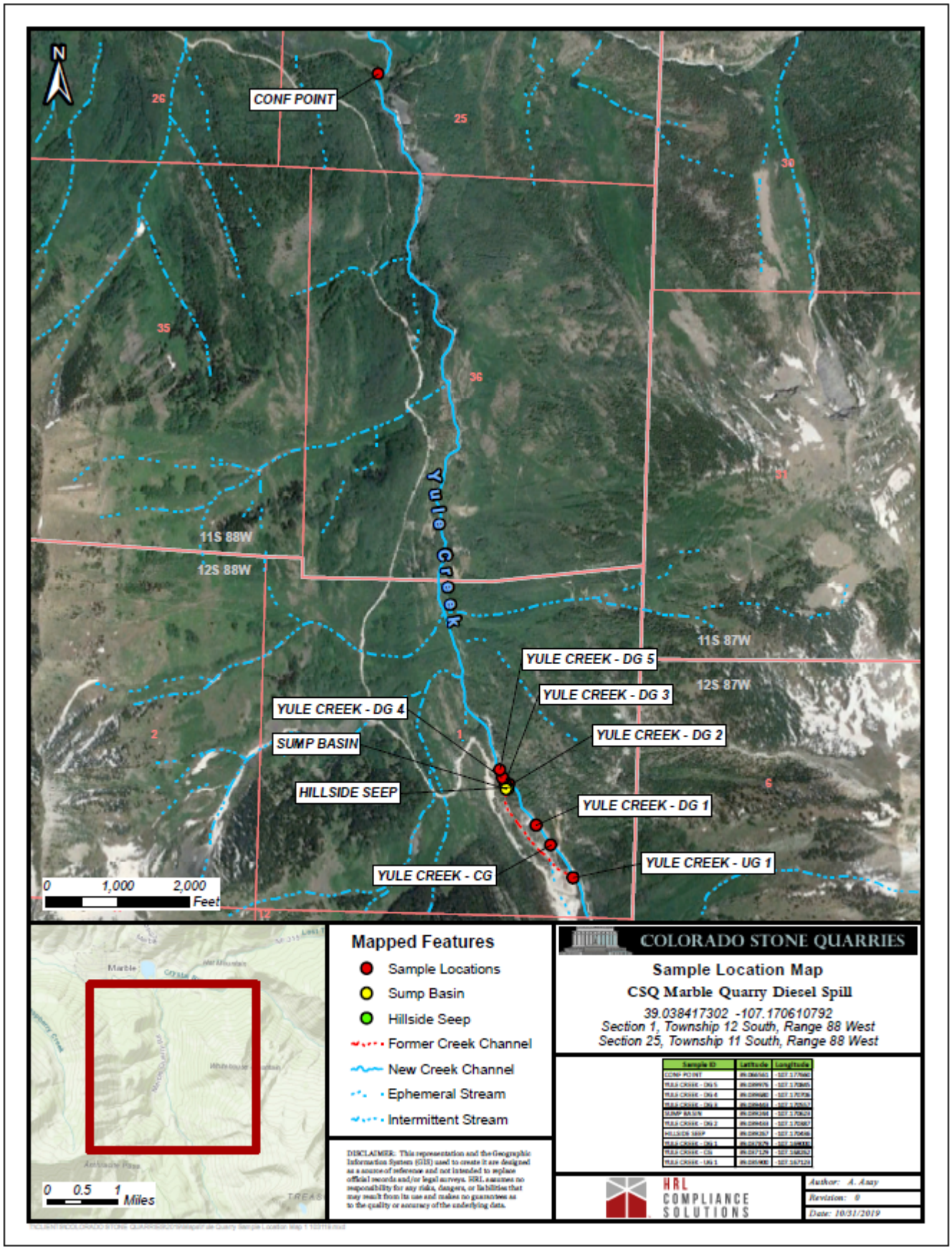
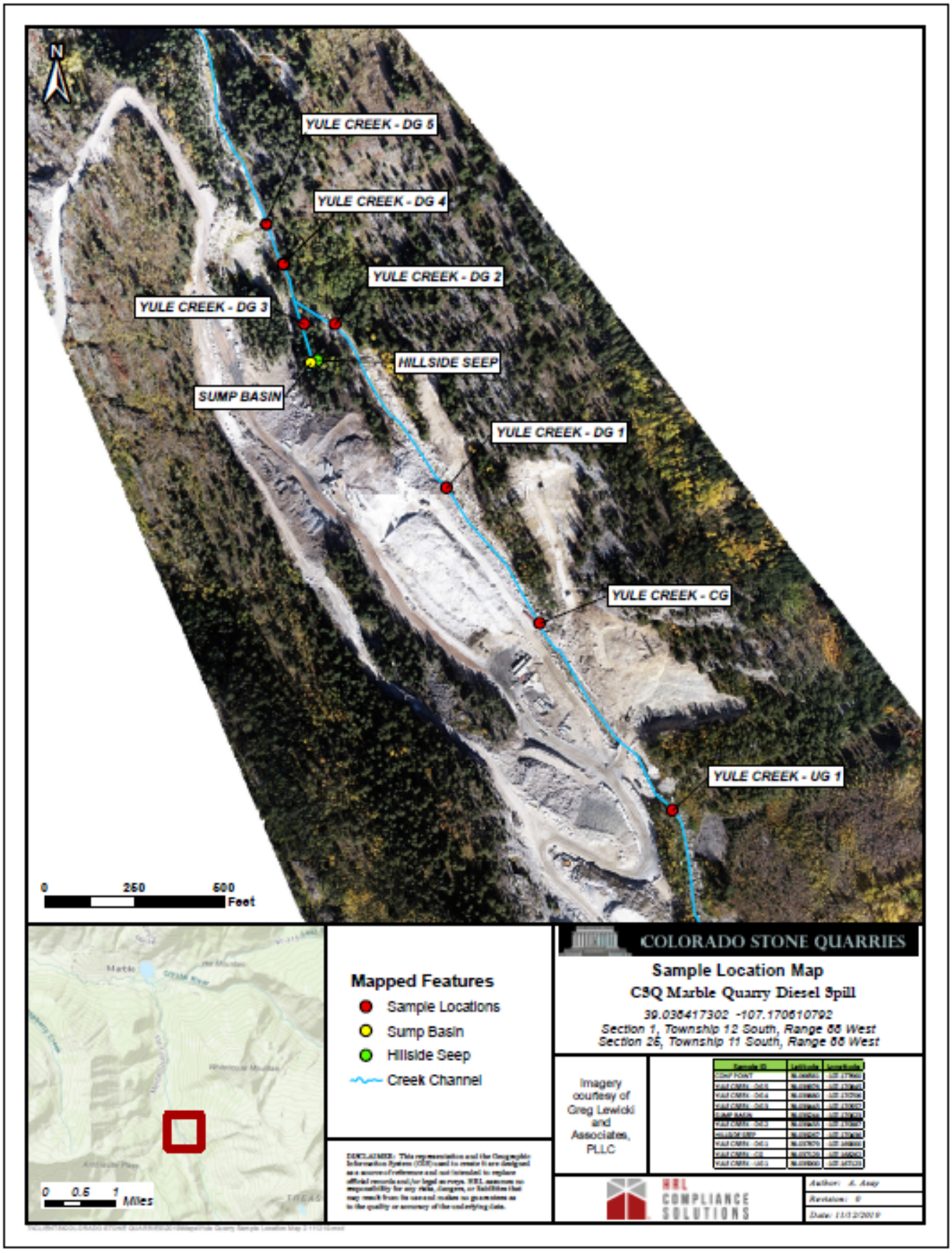


FIGURE 3

Surface Water Sample Location Map – Aerial Image



COLORADO STONE QUARRIES

MARBLE QUARRY DIESEL SPILL

BIOREMEDIATION TREATMENT PLAN

Gunnison County, CO

March 12, 2020

HRL COMPLIANCE SOLUTIONS

Prepared by:
HRL Compliance Solutions, Inc.
2385 F ½ Road
Grand Junction, CO 81505

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FIGURES

I. Purpose and Scope

This plan outlines the bioremediation treatment details associated with the diesel fuel spill that resulted in ~5,500 gallons of diesel being released to the underlying soils as the result of a diesel pump supplying fuel to a generator mishap.

Colorado Stone Quarries (CSQ) reported on October 16, 2019 to the Department of Reclamation and Mining Safety (DRMS) and Colorado Department of Public Health and Environment (CDPHE) that a diesel fuel release occurred on October 12, 2019 from an above ground storage tank, impacting the underlying soils below the tank and generator. CSQ personnel discovered diesel fuel daylighting within a downgradient sump, ~1,200 feet downgradient. The CDPHE issued the release spill tracking # 2019-0587 and noted that DRMS will be the lead agency on monitoring the remediation.

HRL Compliance Solutions Inc. (HRL) was contracted on October 23, 2019 to perform an initial onsite and evaluate the impacted area to provide support for initial clean-up in conjunction with remediation, sampling, waste management and monitoring support.

The following information is to provide details of the treatment process, frequency, contingency plans and ultimately closure of the diesel impacted material. It should be noted that changes in the project scope may directly affect the specifics of this treatment plan.

II. Plan Applicability

This plan is applicable to the in-situ bioremediation of the diesel impacted soil in the underlying fill material and area designated as the "sump basin". This plan is not intended to be used as a ground/surface water remediation plan and is limited to soil/solid media.

A. Bioremediation Background

Enhanced and augmented aerobic bioremediation technologies are used to accelerate naturally occurring in-situ remediation of petroleum hydrocarbons by indigenous microorganisms and supplement with additional hydrocarbon-degrading microbes in the subsurface. Enhanced aerobic bioremediation technologies to be utilized at this site include the addition of a specifically formulated and engineered Micro-blaze product targeting diesel range organics (C12-C15) through the addition of hydrocarbon-degrading bacteria such as pseudomonas, bacillus, brevebacterium, and others. In addition to the bacteria, there are other non-toxic trade secrete compounds that increase the production of biosurfactants to facilitate the reduction of surface tension and formation of micelles enabling the release of hydrocarbons from soil chemical bonds allowing for microbe utilization. In addition to utilizing enhanced augmented methodologies, the use of oxygen releasing compounds such H2O2 to chemically enhance the treatment water will be employed to maintain optimal aerobic activity. These technologies work by providing a supplemental supply of oxygen to the subsurface, which becomes available to aerobic, hydrocarbon-degrading bacteria. The stoichiometric ratio of oxygen per hydrocarbon is 3 M O2 per 1 mole of hydrocarbons. Oxygen is considered by many to be the primary growth-limiting factor for hydrocarbon degrading bacteria, and it is normally depleted in zones that have been contaminated with hydrocarbons. By using these technologies, rates of biodegradation of petroleum hydrocarbons can be increased at least one, and sometimes several, orders of magnitude over naturally-occurring, non-stimulated rates.

Of all the limiting factors associated with active aerobic bioremediation, the primary limiting factor will be temperature. Typically, optimal temperature for average microbe replication is 75°F to 90°F. Activity will be reduced as temperatures vary from the optimal range. Expected site conditions will be between 55°F and 60°F and slower than optimal activity is expected. Since treatment is planned through the addition of water, microbes, oxygen and nutrients utilizing treatment ports, temperature will be manipulated to maintain more optimal conditions when possible as described below.

During the treatment process, if it is identified that ground/surface water is impacted, an amendment or revision to the bioremediation plan will be conducted outlining the specifics of groundwater and surface water monitoring and remediation.

III. Bioremediation Treatment Port Design

For soils that cannot be excavated and transported offsite to disposal at South Canyon Landfill, HRL proposes to treat the impacted soils in-situ via infiltration of bioremediation treatment through a PVC infiltration piping gallery and gravity feed percolation.
Three (3) 10-slot 2" PVC laterals will be installed horizontally in the bottom of the excavation at the release point of origin. The treatment system will be installed approximately 10 feet below ground surface (bgs), with each lateral extending approximately 25-30ft. The slotted PVC piping system will be placed on the southeastern and southwestern side of the excavation, and one lateral extending through the middle of the impacted area (See Figure 1). The horizontal laterals will come together at one focal point located on the southeast corner of the excavation but contain separate ports for flow control and isolation of the treatment lateral.
The 2" PVC riser ports extending above ground will contain a butterfly valve and a threaded plug to prevent precipitation from entering the ports, as well as aid in preventing freezing of the bioremediation product.

During construction of the treatment ports, modifications to the center lateral may consist of solid stem PVC with slotted 2" PVC pipe extending off the main line to increase the effective treatment area and additional underlying pathways throughout the impacted area.
The treatment system will be backfilled with 3/4-inch washed gravel providing protection and preventing a compacted oxygen depleted environment (See Figure 2).
Once the gravel is placed around the infiltration laterals, backfilling of the excavated area will occur with clean fill material from the surrounding area. Large marble blocks will be placed within the excavation adjacent to the PVC pipe for added support. Upon backfilling of the excavated area, CSQ will install a poly liner to serve as spill containment for the generator and fuel tanks.

IV. Infiltration Trench

Groundwater monitoring wells will be installed downgradient of the in-situ treatment system to monitor the effectiveness of the treatment process. If it is determined that the treatment application is not adequately treating areas downgradient or missing target areas, infiltration trenches can be installed to allow additional application of bioremediation product.

Due to the location of this release and winter weather, as well as limited information currently available regarding the area of influence from the initial treatment, infiltration trenches would not be recommended until the spring/summer of 2020 when the soils and outside temperatures are more favorable to bioremediation.

V. Product Application

The initial application of bioremediation product will be applied at a 10% concentration to the soils within the open excavation via aspiration nozzle and pump. A total of 500-550 gallons will be utilized during the initial application from fresh water pumped from the adjacent Yule Creek. Fresh water from Yule Creek is ideal due to the water already containing the natural elements typical for this area, as well as a great source of dechlorinated water, preventing mortality of the bioremediation enzymes.
Water and Microblaze product will be mixed together at the appropriate ratios and sprayed into the excavation during the initial treatment to provide a thorough application prior to backfilling. For subsequent treatment applications, micro-blaze, nutrients and oxygenating compounds will be gravity fed through the treatment system.

B. Winter Treatment

Follow-up applications via the infiltration ports will occur monthly throughout the winter months when conditions allow. Product will be applied at an 8-10% concentration, utilizing water from Yule Creek and mixed onsite as needed. The amount of bioremediation product applied will vary on timing of the year but will typically consist of 550-1000 gallons of water to bioremediation product and amendments.

C. Summer Treatment

During the spring/summer months, when temperatures are optimal for bioremediation activity and snow runoff is occurring, a second treatment will be applied to continue the bioremediation process. Additionally, based on runoff volumes, a higher quantity may be applied using the runoff water flowing above the previous creek channel to provide the necessary ratio to activate the microbes and transport the product downgradient. Summer treatments are going to vary based on hydrocarbon concentrations within the downgradient monitoring wells and hydrocarbon concentrations within the soil. The amount of treatment product will likely remain the same, 550-1000 gallons, although concentrations and frequency are going to be dependent on conditions and contaminant concentrations.

D. Treatment Conditioners

As with all microbial activity, bioremediation products require a food source and oxygen. It will be necessary to include a periodic treatment of oxygenated water and liquid fertilizers to enhance and keep the microbial activity optimal

VI. Closure

Closure of the project will be based on the conditions set forth by the regulatory agencies providing oversight. Upon completion of the bioremediation process, PVC infiltration ports can be filled with sand and/or cut at or below ground surface and capped.

VII. Conclusion

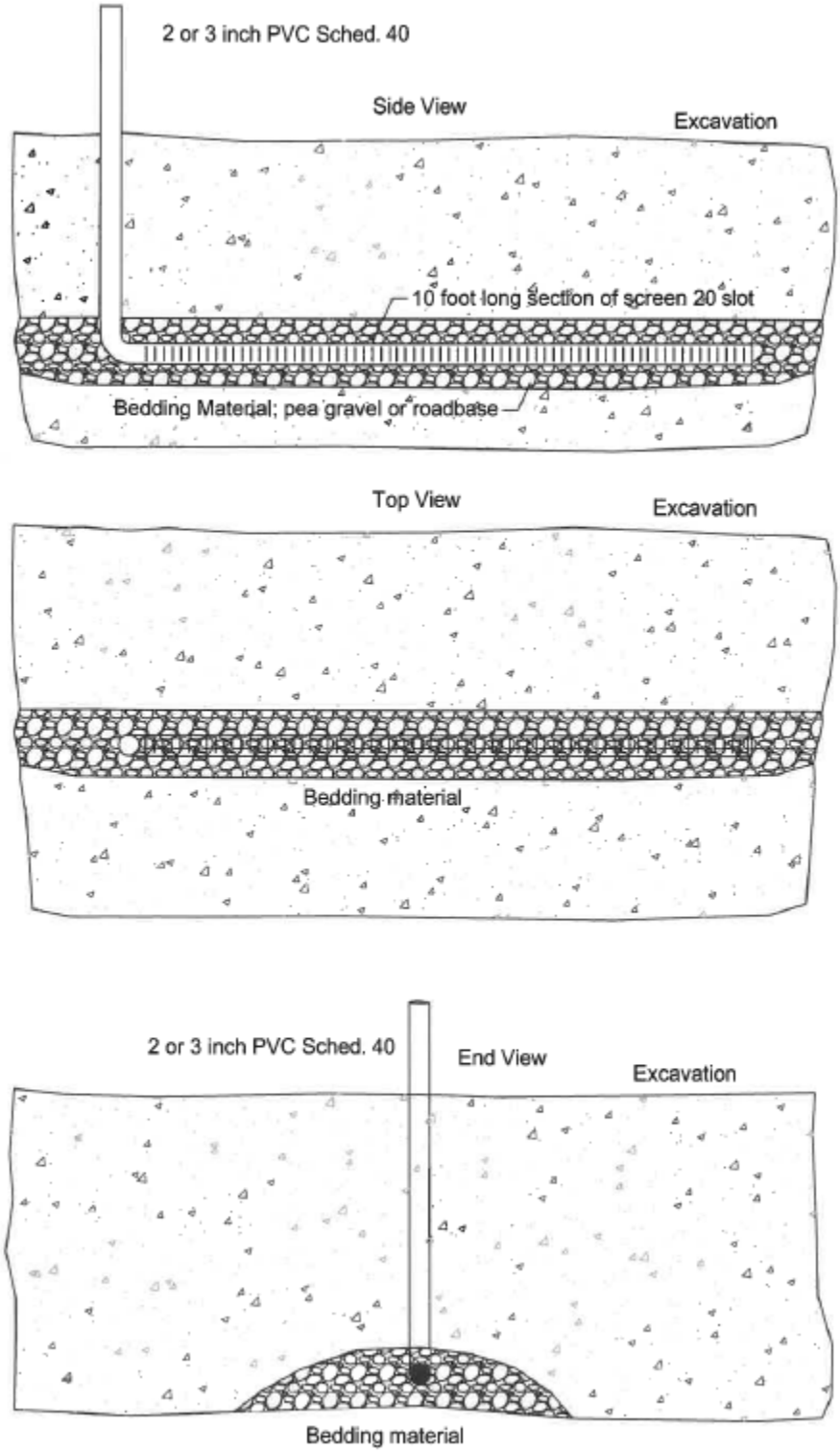
The information outlined above is designed and intended the enhance the bioremediation of diesel impacted soils. Please note that changing conditions, site activity, geochemistry and other unforeseen circumstances may

affect the treatment process which will require modifications to the treatment process. All changes or modifications to the bioremediation process will be communicated and provided in a written revision/amendment to this plan.

As underlying soil conditions have not been evaluated HRL cannot provide a timeline of when the proposed in-situ remediation will be completed, however due to the location of the release and composition of the fill material, HRL feels that in-situ is the most effective course of remediation at this time.

Figure 1: Treatment System Design

Figure 2: Treatment System Injection Port Design



Colorado Stone Quarries - Diesel Spill Soil Data Tracking							Analyte	TVPH (GRO)	TEPH (DRO)	Benzene	Toluene	Ethylbenzene	Xylenes (total)	Acenaphthene	Anthracene	Benzo (A) anthracene	Benzo (B) flouranthene	Benzo (K) fluoranthene	Benzo (A) pyrene	Chrysene	Dibenzo (A,H) anthracene	Fluoranthene	Fluorene	Indeno (1,2,3-C,D) pyrene	Naphthalene	Pyrene
								Analytical Analysis																		
Location	**Sample Location**	**Sample ID**	**Sampler**	**Date**	**Time**	**Laboratory**	**CDPHE Thresholds reference EPA Regional Screening Levels (RSLs)**	520	96	1.2	4,900	5.8	580	3,600	18,000	1.1	1.1	11	0.11	110	0.11	2,400	2,400	1.1	3.8	1,800
Point of Release	South Excavation Pothole	Side Wall @ 2ft	Rowe	10/28/19	14:10	ALS		32	24	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0052	ND	ND	0.0045
Spill Impacted Area	Excavation	SE Wall @3ft	Rowe	11/01/19	11:00	ALS		1,900	17,000	-	-	-	-	1.1	0.71	ND	ND	ND	ND	ND	ND	0.16	2.6	ND	4.5	1.9
		North Wall @ 2ft			11:10	ALS		6.5	35	-	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.006	ND	ND	0.004
		NE Wall @ 2ft			11:20	ALS		ND	18	-	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		Exc Bottom @10ft			11:30	ALS		320	1,800	-	-	-	-	0.14	ND	ND	ND	ND	ND	ND	ND	ND	0.32	ND	0.76	0.26

(-) indicates data is still in process by the lab
- Indicates analytical that is no longer being monitored
Exceedances are highlighted in yellow. Results below the standard or reporting limit are reported as ND
All results are presented in mg/kg, unless otherwise noted