

MEMO

State of Idaho

Idaho Department of Water Resources

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Date: November 22, 2017

To: Roger Chase, Chairman, Idaho Water Resource Board
Mat Weaver, P. E., Deputy Director, Idaho Department of Water Resources

From: Aaron Golart, Water Compliance Bureau

Subject: Review of 23 Special Supplement Permit Conditions for Small Scale Suction Dredge Mining on the South Fork Clearwater River

Purpose of Memo

Following the 2016 South Fork Clearwater River (“SFCR”) dredge season, the Idaho Water Resource Board (“IWRB”) and the Idaho Department of Water Resources (“IDWR”) received numerous oral comments and written correspondence from dredge miners and at least one mining organization expressing dissatisfaction with the Special Conditions placed on the SFCR Special Supplement permit (“Special Supplement”) used to authorize power sluicing and dredge mining on the SFCR. In response to those concerns, IWRB and IDWR staff scheduled a Public Listening Session in Grangeville, Idaho on June 21, 2017, to receive comments on IDWR’s permitting process for suction dredge mining on the SFCR. During the June 21 Listening Session and in correspondence received by the IWRB and IDWR following the listening session, many people and organizations expressed both support and opposition to the Special Conditions for the 2017 dredge season. After consideration of the requested condition changes and comments received by parties during and following the listening session, the IWRB and IDWR revised the Special Conditions for the 2017 dredge season. Certain Special Conditions changes proposed by some dredge miners were not considered by IDWR because the changes were either contrary to law or there was insufficient time to review the technical merits and basis for the condition prior to the start of the dredge season.

Following the 2017 dredge season, the IWRB and IDWR agreed to reengage in discussions to consider the following: (1) review changes to the Special Conditions from 2017 dredge season; (2) consider additional changes to the Special Conditions for the 2018 dredge season; and (3) review the technical and scientific basis for the 15 permit limit and Special Conditions.

This memo has been prepared in advance of a second public listening session regarding SFCR Special Supplement, scheduled for December 5, 2017, in which the IWRB and IDWR will take public comments regarding changes to Special Conditions categorized as receiving delayed consideration.

Background

IDWR is the state agency given primary responsibility to administer the Idaho Stream Protection Act (“Act”), which regulates alteration of streams in the state.¹ The Act declares “[n]o alteration of any stream channel shall hereafter be made unless approval” has been given by the Director of IDWR.² Rule 34.01 of the Idaho Stream Channel Alteration Rules (“Rules”) (IDAPA 37.03.07) states that “any applicant proposing to operate a vacuum or suction dredge within or below the mean high water mark of a stream channel shall apply for and obtain a stream channel alteration permit. The vacuum or suction dredge shall only be operated in accordance with the conditions of the permit and with the applicable rules.”³

The IWRB’s South Fork Clearwater River Basin Comprehensive State Water Plan (“SFCR Plan”) allows limited small scale suction dredge or placer mining on the main SFCR subject to IDWR permitting and upon requests by miners using the Special Supplement.

Letter Permit Process

IDWR has regulated and permitted suction dredge activities in the state since first implementing the Idaho Stream Protection Act in the 1970s. IDWR’s current stream channel alteration rules were adopted by the Legislature in 1993. IDWR has adopted an expedited process for permitting suction dredge operations that meet minimum standards outlined in the Rules. Minimum standards, as described in the Rules, “are intended to cover the ordinary type of stream channel alteration and prescribe minimum conditions for approval.”⁴ Minimum standards for suction dredges apply to dredges with a nozzle diameter size of five (5) inches or less powered by motors or engines rated at fifteen (15) horsepower (HP) or less and non-powered sluice equipment moving more than one-quarter (1/4) cubic yards per hour.⁵ For purposes of this memo, suction dredges having a nozzle diameter of 5 inches or less powered by equipment engines rated at 15 HP or less are referred to as small scale suction dredges.

Except for the SFCR, IDWR permits small scale suction dredges or mining operations meeting minimum standards, using the Idaho Recreational Mining Authorization or expedited “Letter Permit” on all open streams and rivers in the state identified within IDWR’s mining permit instructions. The Letter Permit is a pre-signed authorization letter from IDWR that includes the minimum standard conditions for small scale suction dredges found in the Rules plus some additional conditions. The Letter Permit may be obtained annually and only requires the following:

- Name and contact information (address, email, phone);
- Identification of drainage and stream segments where a dredge will be operated;
- Submittal of applicable permit fee (\$10 resident, \$30 non-resident); and
- Signature of miner or applicant acknowledging a review and understanding of IDWR’s instructions for dredge mining and that the mining operations will conform with IDWR’s instructions, rules and Letter Permit conditions.

¹ Idaho Code §§ 42-3801 – 42-3803

² Idaho Code § 42-3801

³ IDAPA 37.03.07.030.04

⁴ IDAPA 37.03.07.055.

⁵ IDAPA 37.03.07.064.01

Special Supplement Permit Process

The Special Supplement is used for evaluation and permitting of power sluicing and dredge mining activities that meet minimum Rule standards and are located on the SFCR between its confluence with the Middle Fork Clearwater River and the confluence of the Red and American Rivers. The Special Supplement permit requires submittal of additional, site specific information and includes a number of special conditions.

The Special Supplement permit process is required pursuant to the SFCR Plan. The SFCR Plan was adopted by the IWRB in 2004 and approved by the Idaho Legislature in 2005.⁶ The SFCR Plan allows suction dredge or placer mining on the SFCR as follows:

“The main SFCR may be dredged from July 15 to August 15 under the Recreational Dredging Permit⁷ if request is made on the Special Supplement. The site must also be inspected by IDWR with a fishery biologist. With that authorization, IDWR will issue a letter of approval.”⁸

Analysis of Special Conditions:

Each of the Special Supplement conditions are listed below followed by a short analysis that addresses the intent and expected mitigation effect of the condition. A table attached to this memo lists each condition with brief comments summarizing the analysis and whether the condition has been used by IDWR in past suction dredge permit authorizations.

2017 Special Condition 1: *Dredge mining shall occur only within the wetted perimeter below the mean high water mark (as defined in IDWR Stream Channel Rule 10.08) between July 15, 2017 and August 15, 2017. Activities which would expand the wetted perimeter are not authorized.*

The July 15 - Aug 15 season has been a standard SFCR dredge season since 2001 as per Special Supplement and IDWR dredge mining instructions. Condition language regarding work within the wetted perimeter is consistent with Rule 64.04 and applies to all dredge permits statewide.

Streambanks, riffle crests, inside channel bends, and other rough features that control current are key features that provide habitat for rearing fish and invertebrate food sources. Excavating, widening, and/or piling tailings that modify these features can direct flow into low velocity backwaters, alcoves, side channels, braids, or against streambanks. Disturbance of or reduction in these features is detrimental to multiple life stages of salmonids (Fausch and Northcote 1992; Roni and Quin 2001). Excavating near shorelines and streambanks adds fine sediment to streams, increases slumping and erosion, removes shade and cover, and alters channels and flows. Undercut and vegetated banks have been shown to hold juvenile salmonids during summer and winter months, destabilizing stream banks is harmful to juvenile salmonids (Fausch and Northcote 1992; Roni and Quin 2001) and can reduce their winter survival (Hillman et al. 1987; Smith and Griffith 1994).

⁶ S.B. 1035, 58th Legis., 1st Reg. Sess. (Idaho 2005).

⁷ The Recreational Dredging Permit is currently known as the Letter Permit.

⁸ SFCR *Plan* at 22.

2017 Special Condition 2: *Dredge mining cannot occur until IDWR and a state and/or federal fisheries biologist inspect the proposed dredge sites to identify acceptable dredge locations to avoid reducing the quality of migratory, spawning, and holding habitat for salmonids.*

This condition allows IDWR and a fisheries biologist to identify sensitive habitats and discuss avoidance of those areas with the miner. Areas identified to avoid are generally specific locations rather than extensive stream reaches. Avoidance of sensitive habitat limits overall disturbance, ensuring only certain areas are mined and disturbance is localized rather than widespread.

A similar condition was used as standard condition on all SFCR Special Supplements from 2001 through 2009. This condition states a requirement of the SFCR Plan and is included on the Special Supplement as a matter of law.

2017 Special Condition 3: *Suction dredges shall have a nozzle diameter of five inches or less and a horsepower rating of 15 horsepower or less. Pump intakes (but not dredge nozzles) must be covered with 3/32-inch mesh screen.*

This condition limits turbidity, water quality degradation, creation of fines in active channel, degrading substrate quality, noise, and total area of disturbance. The small mesh screens protect small fish, eggs, and invertebrates, as well as pumps and valves on the dredge itself. Dredge size limits are set by Rule 64.01. The condition is a requirement of the SFCR Plan and is included on the Special Supplement as a matter of law.

2017 Special Condition 4: *An IDWR SFCR suction dredge ID card shall be attached to the dredge in a visible location at all times the dredge is located on the SFCR.*

This condition is consistent with IDWR's transition to issuing permits to dredges or power sluices as opposed to dredge operators as done prior to 2016. Attaching the ID card to the dredge in a visible location is evidence that the dredge is operating pursuant to a specific IDWR SFCR permit. It allows staff from IDWR or land management agencies, as well as other miners and the public, to know that the dredge is permitted and can be legally operated.

The issuance of the IDWR ID card is unique to the SFCR and is within IDWR's general authorities. Issuance of permit ID cards allows more than one operator to share one dredge without the need for individual operator permits and fees. Issuance of permit ID cards potentially allows several different miners to work one permitted site as long as only one dredge is operated at one time per site. For example, a permit holder may mine a site for one week while a second miner works the same site a different week. While a second miner may work at a specific permitted site, the permit holder assumes responsibility for all mining work under the permit.

2017 Special Condition 5: *In-stream mining activities shall only take place during daylight hours.*

This condition allows unimpeded fish movement and normal behavior at night, reduces mining effort which helps limit sedimentation and total area of disturbance, and limits light and noise disturbance. The SFCR is generally a shallow, clear water river during summer low flows. During daylight, most fish seek refuge in substrates, banks, pools, and other cover to avoid predators. In these conditions, fish migration and other movement often occurs in low light and at night.

Suction dredge mining primarily occurs in summer, when water flows are lower, water temperatures higher, and water clarity is greatest. As water clarity is important, dredging occurs during daylight hours. Fish primarily feed early and late in the day while suction dredge mining occurs during daylight hours. Although there may be a short period of overlap between fish feeding and mining, it may not be of sufficient duration to impede the fish ability to secure prey (NMFS 2016).

2017 Special Condition 6: *Dredge mining sites shall consist of a maximum of two separate locations of 150-linear feet each.*

Limiting dredge mining sites to two locations of 150 linear feet each creates manageable areas for IDWR staff and a fishery biologist to inspect and delineate sites as required by the SFCR Plan. Ideally, sites are proposed by the miner and delineated on-site with the miner before the season or at the start of the season. The delineated sites are then inspected during the season and after the season.

Review of 2015 and 2016 post-season reports completed by the USFS NPCNF staff for dredge sites on the SFCR shows that the total linear feet dredged per site ranged from about 10 to 100 feet, with an average of about 42 feet per site. The reports showed that most miners dredged a total of about 50 linear feet per site. The 2015 report showed several miners working two separate sites of not more than approximately 50 linear feet per site. One miner reportedly worked three sites that were 31 to 38 feet each and a cumulative total of about 104 linear feet. The current 150 linear foot dredge site limitation is similar, although greater in magnitude, than average dredge site lengths reported by USFS NPCNF staff.

IDWR has used a special condition on SFCR Special Supplement approvals in prior years limiting the number of sites to three and total cumulative linear feet to no more than 1,500 feet.

2017 Special Condition 7: *Dredged or excavated holes shall be back filled with the same material that was excavated on or before August 15, 2017 (i.e. the last day of the 2017 SFCR dredge mining season).*

Dredge holes and tailings piles that are restored to original grade improves aesthetics and reduces the likelihood of permanently altering channels and flow. In addition, un-reclaimed dredge holes and sediment piles constitute hazards in the stream channel to boaters and other users of the river leading to liability concerns as a result of permitted dredge activity. Deposited sediment affects stream biota via changes to substrate structure, reduction of habitat space, and food availability. The overall negative impact of sediment accumulation on biological response variables has been confirmed by several studies (for reviews, see Kemp et al. 2011; Jones et al. 2011, 2012). Other research finds that deposited sediment is a degrading stressor for stream biota (Olsen and Townsend 2003; Wagenhoff et al. 2012). Additional studies suggest that fine sediment deposition can cause sensitive invertebrates to decline (Burdon et al. 2013). Sedimentation has strong effects on two key ecosystem processes: primary production (algae biomass accrual) and leaf decomposition. Deposition of sand buries and impedes algal production and reduces microbial activity, which together reduce the overall energy production of streams. Increased sand deposition affects invertebrate habitat by clogging the gravel interstices and food availability by covering organic material (Wood and Armitage 1997; Danger et al. 2012).

NMFS (2016) recently summarized information on the effects of suction dredging in the SFCR. The physical effects anticipated from excavation of substrate that creates holes and mounds in the stream bottom and the outfall of silt and sand below the dredge that causes turbidity and covers and fills stream substrate have the potential to:

- Impede upstream and downstream movement of adult and juvenile salmon and steelhead;
- displace the fish from spawning and rearing habitat;
- expose particularly juvenile fish to adverse effects from turbidity;
- reduce availability and quality of spawning gravels;
- reduce survival of eggs and pre-emergent fry in the gravels;
- reduce instream cover and interstitial spaces in the substrate for rearing and overwintering juvenile fish;
- reduce production of invertebrate prey species for juvenile salmon and steelhead; and
- alter reach hydrology and habitat function.

Filling in dredge holes with the material that was removed will help to mitigate the outlined physical effects.

2017 Special Condition 8: *Permittee shall not alter the stream channel in a manner that creates a physical barrier that prevents upstream or downstream fish movement.*

Dredge activity that results in a physical barrier to adult and juvenile salmonids, such as piled sediment that physically blocks channels and prevent fish movements, can reduce available habitat and access to spawning and rearing areas resulting in decreased production (NMFS 2016).

This condition is consistent with IDEQ § 401 Water Quality Certification for small placer miners in Idaho which states “the permittee shall ensure there is adequate passage for fish around and through the mining area at all times (IDEQ, 2013).

2017 Special Condition 9: *Dredge mining shall be excluded in areas within 100 feet upstream and 300 feet downstream of perennial tributaries and shall not hinder fish access to fish-bearing tributary mouths through disturbance, turbidity, or modifications of channel depth or substrate arrangement. If a permittee proposes to dredge mine within 100 feet upstream and 300 feet downstream of a perennial tributary it must be determined acceptable by the IDWR and fisheries biologist during site inspection.*

Tributary mouths are areas of cold, deep water and diverse habitat that support rearing salmonids. Tributary mouths provide staging, holding, and spawning areas for salmonids. Salmonids often reside in the SFCR throughout summer in or near thermal refugia such as deep pools and cold tributary plumes and in main stem reaches cooled by tributaries (Dobos 2015). During summer, the coolest reaches of the upper SFCR are in its canyon where cold tributaries flow into the river (e.g., Tenmile and Johns Creeks).

2017 Special Condition 10: *Dredge mining shall not occur on gravel bars at the tails of pools. Dredge mining shall not occur in a manner that deposits fine sediment (sand or silt) on gravel bars to a depth of more than 1/2-inch.*

This condition limits the amount and depth of fines deposited on substrates from mining activity, which reduces the suffocation of eggs (fish, invertebrates, mussels, and other forage). In

addition, this condition prevents the direct loss of functioning substrate habitat by limiting the filling of interstitial spaces within the substrate with sand/fines and sedimentation mobilized as a result of mining activity. Research has improved the understanding of the adverse ecosystem impacts from suspended and surficial fine sediment (Newcombe and Jensen 1996; Wood and Armitage 1997; Henley et al. 2000; Suttle et al. 2004; Muck 2010; Miller et al. 2008; Brusven and Rose 1981). The reduced function of benthic and hyporheic substrates and the negative effects on ecosystems from added fine sediment are predictable and significant (Mathers et al. 2017; Lisle 1982). Dredge mining increases the amount of sand in the active channel, which reduces the quantity and quality of habitat for spawning, incubating, and rearing salmonids and their preferred forage.

The adverse effects from sedimentation worsen, readily become unsustainable, and require more years to recover with increased areas of disruption, repeated chronic disturbances, and increased background proportions of fine sediments. The adverse effects of overburden disposal and sedimentation caused by suction dredge placer mining cannot be fully prevented. Deposited sediment negatively affects stream biota by changing substrate structure, reducing habitat space, and reducing food availability. The overall negative impact of sediment accumulation on biological response variables has been confirmed by several studies (for reviews, see Kemp et al. 2011; Jones et al. 2011, 2012).

Fine sediment generated by dredging is carried downstream for variable distances, which are usually short for sand during low flows and can be longer for smaller fines and clays. Suspended sediments fall out of suspension and aggrade behind boulders and large cobbles that slow current. An immediate adverse impact is the loss of substrate roughness through an increase in surficial fine sediment. Sand settles and drifts into dunes behind any cover or structure protruding from the stream bottom, fills interstitial spaces, and simplifies channels and habitat. The primary habitats that small fish and their prey need to survive and grow will be reduced in amount and quality by sedimentation. Other research finds that deposited sediment is a degrading stressor for stream biota (Olsen and Townsend 2003; Wagenhoff et al. 2012). It has been suggested that fine sediment deposition can cause sensitive invertebrates to decline (Burdon et al. 2013). Sedimentation has strong effects on two key ecosystem processes: primary production (algae biomass accrual) and leaf decomposition. Sand that settles out after mobilization from mining activity can bury and impede algal production and reduce microbial activity, which together reduces the overall energy production of streams. Sand addition affects invertebrate habitat by clogging the gravel interstices and reducing food availability by covering organic material (Wood and Armitage 1997; Danger et al. 2012). Among the burial studies reviewed, the short duration of sand covering tests resulted in variable mortality, with low mortality rates in some instances. However, Krueger et al. noted that virtually all (90%) mussels covered with a few inches of fine sediment died. Although only about 13% died within 48 hours, the rest were in the process of dying and could not be kept alive, even after uncovering them. Mussels and snails are particularly susceptible to lethal burying in suction dredge tailings, overburden piles, and in areas of sediment settling below turbidity plumes (Krueger et al. 2007; Marking and Bills 1979).

Spawning and rearing salmonids prefer natural habitat to unnaturally disturbed substrates, which can be unstable sites for redds (nests) during higher flows (Harvey and Lisle 1999). Natural stream processes sort cobble and gravel substrates according to sediment size and stream velocity. Cobble, the appropriate size for salmonid spawning, is naturally located in stream tailouts and other areas that provide ideal environmental conditions (stream velocity, oxygenated

water, etc.) for successful salmonid spawning. Disturbance of these areas or movement of this size substrate into areas less conducive to salmonid spawning is detrimental.

In shallow water, cover is required to escape overhead predators. Needed cover can be found in stream substrate in the interstitial spaces and pore spaces through which water flows that are used for cover by invertebrates and juvenile salmonids. Embeddedness is a measure that relates to how much fine sediment or hardpan surrounds cobbles and gravels on stream bottoms. In spawning and rearing areas, higher rates of embeddedness are strongly negative to survival of young salmonids and their forage. Generally, the more area of substrate covered in fine sediment, the lower the survival rate for salmonids.

Bankfull flows are usually adequate to clean substantial areas of substrate to some extent. Bankfull flow conditions on average reoccur every 1 - 3 years and only during winter/spring runoff. Following a bankfull or greater event, lower flows may continue shifting fine sediment and shaping low flow channels as the water surface falls and stream current slows. During low flows, any disturbance of fine sediment or unpacking of previously buried fine sediment will result in the deposition and covering of active channel substrate by sediment until the next bankfull or greater high flow event. For summer mining, the next high flow event will not typically occur for at least another six months, which includes the entire winter and nearly half the growing season (Hillman et al. 1987; Smith and Griffith 1994). In years with lower peak flows, some fines will remain deposited on active channel substrates near where they were placed, others will be moved downstream, but the fines will remain in channel substrates and habitats.

Reestablishment and productive growth of biofilms (algae, periphyton) can only occur during warm seasons. Substrates disturbed by mining during late-summer and fall will be colonized by algae and invertebrates over the next growing season. Areas and rates of reestablishment and productivity are related to the area and intensity of disturbance. Small disturbed areas will likely reestablish relatively quickly and become productive again; however, larger disturbed areas with deposits consisting predominately of sand slow recovery time. Baseline habitat conditions throughout the SFCR and tributaries include high proportions of fine sediments (IDEQ and EPA 2003). Heavy loads of sand present special problems. Winter cover for fish and invertebrates is limited by sand (Hillman et al. 1987; Smith and Griffith 1994). Productivity during growing season is reduced. Streams are simplified and fewer areas are highly productive overall.

2017 Special Condition 11: *Dredge mining shall not occur within two feet of stream banks. Permittee shall prevent the undercutting and destabilization of stream banks. Woody debris or boulders that extend from the bank of the channel shall not be disturbed.*

Salmon fry often rear in highest densities along stream perimeters, many older juveniles rear and hide in streambanks. High rates of sediment addition to a channel may increase erosion and reduce stream stability.

Excavating near shorelines and stream banks adds fine sediment to streams, increases slumping and erosion, removes shade and cover, and alters stream channels and flows. Undercut and vegetated banks have been shown to hold juvenile salmonids during summer and winter months. The destabilization of stream banks can lead to the loss of undercut and vegetated banks which results in the loss of critical habitat that is detrimental to juvenile salmonids (Fausch and Northcote 1992; Roni and Quin 2001).

Moving boulders or large woody debris can redirect flow, alter channels, and reduce habitat that may have been functioning as cover and a current block for fish and invertebrates. Use of large woody debris by a variety of salmonid species is well documented by scientific literature. Disturbance or reduction of these structures is detrimental to multiple life stages of salmonid (Fausch and Northcote 1992; Roni and Quin 2001).

The prohibition of dredge mining adjacent to the stream banks and the removal of woody debris prevents unnecessary disturbance and negative effects on threatened and endangered species in the SFCR. Conditions with similar restrictions have been used by IDWR on the SFCR dating back more than 15 years.

2017 Special Condition 12: *Dredge mining shall not disturb the stream bank and associated habitat, deposit sediment against the bank, cause erosion or destruction of the channel, undercut the bank, or widen the channel.*

Excavating near shorelines and streambanks adds fine sediment to streams, increases slumping and erosion, removes shade and cover, and alters stream channels and flows. Undercut and vegetated banks have been shown to hold juvenile salmonids during summer and winter months. The destabilization of stream banks can lead to the loss of undercut and vegetated banks which results in the loss of critical habitat that is detrimental to juvenile salmonids (Fausch and Northcote 1992; Roni and Quin 2001).

Moving boulders or large woody debris can redirect flow, alter channels, and reduce habitat that may have been functioning as cover and a current block for fish and invertebrates. Use of large woody debris by a variety of salmonid species is well documented by scientific literature. Disturbance of or reduction in these structures is detrimental to multiple life stages of salmonid (Fausch and Northcote 1992; Roni and Quin 2001).

Prohibiting dredge mining adjacent to stream banks and prohibiting the removal of woody debris prevents unnecessary disturbance and negative effects on threatened and endangered species in the SFCR. Conditions with similar restrictions have been used by IDWR on the SFCR dating back more than 15 years.

2017 Special Condition 13: *Permittee shall not remove, relocate, break apart or lessen the stability of substantial in-channel woody debris or in-stream boulders (greater than 12 inches median diameter) unless it was determined acceptable by the IDWR and fisheries biologist during site inspection.*

Large woody debris and other natural structures found in stream channels are important to hydro geomorphology and ecological function (channel, substrate, hyporheic exchange, physical cover, and food web). Removing or disturbing such features increases adverse impacts to an ecosystem that is already cover-limited (few large woody debris, highly embedded cobbles) and substrate-function limited (simplified habitat of sand, with reduced hyporheic exchange). Moving boulders or large woody debris can redirect flow, alter channels, and reduce habitat that may have been functioning as cover and a current block for fish and invertebrates. Use of large woody debris by a variety of salmonid species has been well documented in the literature. Disturbance or reduction of these structures is detrimental to multiple life stages of salmonid (Fausch and Northcote 1992; Roni and Quin 2001).

This condition is similar to standard condition 8d used on all Form Letter Permits from 2000 through 2009 that prohibited the "removal or relocation of boulders in the streambed or bank. Boulders may be moved to facilitate dredging, but they must be returned to their original location." This former condition is more restrictive than the current Special Condition 13. The reference in the current condition to not removing or relocating boulders and woody debris greater than 12 inches is less restrictive and clarifies the size of boulders and woody debris to which the condition applies. Moreover, the current condition gives some discretion and flexibility to IDWR staff and the fisheries biologist to move or relocate boulders and debris larger than 12 inches.

2017 Special Condition 14: *Permittee shall visually monitor the stream for 150 feet downstream of the dredge mining operation. If turbidity is observed more than 150 feet downstream, the operation must cease or decrease in intensity until no turbidity is observable more than 150 feet downstream.*

The application of turbidity limits on mining activity reduces the area of actively degraded water quality, metals contamination, and sedimentation (area and volume) in local and downstream habitats and reduces the area of downstream degraded channel and substrate habitat. Research has improved the understanding of adverse ecosystem and biological impacts of suspended and surficial fine sediment (Newcombe and Jensen 1996; Wood and Armitage 1997; Henley et al. 2000; Suttle et al. 2004; Muck 2010; Miller et al. 2008; Brusven and Rose 1981). The reduced function of benthic and hyporheic substrates and negative effects on ecosystems from added fine sediment are predictable and significant (Mathers et al. 2017; Lisle 1982). Dredge mining increases the amount of sand in the active channel, which reduces the quantity and quality of habitat for spawning, incubating, and rearing salmonids and their preferred forage.

Dredge mining often involves fairly deep excavations in sensitive habitats of small streams and generates fine-sediment waste and tailings. Fine sediment generated by dredging is carried downstream for variable distances, which are usually short for sand during low flows and can be longer for smaller fines and clays. Suspended sediments fall out of suspension and aggrade behind boulders and large cobbles that slow current. An immediate adverse impact of dredging is the loss of substrate roughness through an increase in surficial fine sediment. Sand settles and drifts into dunes behind any cover or structure protruding from the stream bottom, fills interstitial spaces, and simplifies channels and habitat. The primary habitats needed by small fish and their prey to survive and grow will be reduced in amount and quality by sedimentation. Spawning and rearing salmonids prefer natural habitat to unnaturally disturbed substrates, which can be unstable sites for redds (nests) during higher flows (Harvey and Lisle 1999). Disturbance of these areas or movement of this size substrate into areas less conducive to salmonid spawning is detrimental.

Deposited sediment affects stream biota via changes to substrate structure, reduction of habitat space, and food availability. The overall negative impact of sediment accumulation on biological response variables has been confirmed by several studies (for reviews, see Kemp et al. 2011; Jones et al. 2011, 2012). Recently, deposited sediment was found to be more degrading a stressor than nutrients for stream biota (Olsen and Townsend 2003; Wagenhoff et al. 2012), and it has been suggested that fine sediment cover in excess of 20% causes sensitive invertebrates to decline (Burdon et al. 2013). Sedimentation has strong effects on the two key ecosystem processes: primary production (algae biomass accrual) and leaf decomposition. Sand buries and impedes algal production and reduces microbial activity, which together reduce the overall energy production of streams. Sand addition affects invertebrate habitat by clogging the gravel

interstices and food availability by covering organic material (Wood and Armitage 1997; Danger et al. 2012).

Adverse effects from sedimentation worsen, readily become unsustainable, and require more years to recover with increased area of disruption, repeated chronic disturbances, and increased background proportions of fine sediments. The adverse impacts of historic dredge placer mining provide an example of the unsustainable nature of too much activity and the time and cost required for stream recovery. The adverse effects of sedimentation caused by suction dredge placer mining cannot be fully prevented but can be minimized. Application of the 150-foot limitation on observable turbidity minimizes the adverse impacts related to sedimentation from dredge mining activity and should result in less time for the area to recover and reestablish natural stream processes.

This condition is similar to standard condition 3 used on all Form Letter Permits from 2000 through 2009 which stated that "[d]redging shall be conducted in a manner such that the return water from the dredge does not significantly increase the turbidity of the stream below the dredging operation or have adverse impacts upon the stream channel, such as channelization."

2017 Special Condition 15: *No mechanized equipment shall be operated below the mean high water mark except for the suction dredge, sluice, pump, or any life support system necessary to operate a suction dredge.*

This condition is nearly identical to Rule 64.03 of the IWRB Stream Channel Alteration Rules (IDAPA 37.03.07). This rule has been in place since 1993. The rule and condition excludes use of other mechanized equipment in the channel below the mean high water mark, such as bull dozers, back hoes, jack hammers, drills, etc. The condition specifies that the dredge itself and equipment that is part of the dredge such as the sluice box, pump, air compressor, etc. is the only mechanized equipment that can be operated in the channel.

2017 Special Condition 16: *Permittee must maintain a minimum spacing of at least 800 linear feet of stream channel between active mining operations.*

This condition ensures turbidity plumes and sand spits from single dredges are not combined into large areas. A spacing condition limits local degradation of water and substrate quality, cumulative degradation of substrate quality (which is already heavily-sedimented), and spreads out disturbed areas to isolated patches rather than continuous large areas.

Pursuant to IDAPA 58.01.02.060 and IDEQ § 401 Water Quality Certification for small placer miners in Idaho, IDEQ authorizes a 500 linear foot mixing zone for turbidity.

2017 Special Condition 17: *All fuel, oil, and other hazardous materials shall be stored outside of the stream channel in containers approved by ANSI or UL for storage of the materials. Permittee shall not operate any equipment that leaks fuel, hydraulic fluid or other pollutants. Permittee shall use a funnel or spill proof spout when pouring fuel and place absorbent material, sufficient to absorb a spill, under and around the fuel tank when refueling. Petroleum absorbent spill kits of suitable size to handle combined fuel volume of all fuel storage containers shall be onsite in case of accidental spills and no petroleum products shall enter the stream when servicing the equipment.*

The condition is intended to be consistent with IDAPA 58.01.02.800 prohibiting storage or disposing of hazardous materials to or near state waters.

NMFS (2016) summarized information on the effects of suction dredging in the SFCR, including fuel leakage and potential for spills into the stream which can result in contamination and reduce water quality.

Placement of this condition on the SFCR Special Supplement minimizes the risk of water contamination from potential spills. A similar condition has been included on all authorized SFCR Special Supplements and Letter Permits statewide since 2000 for the purpose of protecting public health and safety. This 2017 Special Condition was modified in 2017 based on comments from the Tenmile Mining District (“TMD”).

2017 Special Condition 18: *Permittee shall not entrain, mobilize or disperse any mercury discovered during mining operations. Permittee shall not use mercury, cyanide or any other hazardous or refined substance to recover or concentrate gold.*

The condition is intended to be consistent with IDAPA 58.01.02.800 prohibiting storage or disposing of hazardous materials to or near state waters.

If sediments containing heavy metals are brought to the surface and distributed, concentrations of heavy metals to water and substrates could increase (Johnson and Peterschmidt 2005). Due to its toxicity and tendency to accumulate in muscle tissue, mercury exposure could reduce growth, cause neurological damage or cause developmental problems in salmonids (Weis 2009, Sandheinrich and Wiener 2010).

2017 Special Condition 19: *To prevent the threat of aquatic invasive species, suction dredges, tools used while dredging and associated equipment shall be thoroughly cleaned and dried at least 5 days prior to use in the SFCR.*

Invasive species often reduce production of native species.

This condition is consistent with IDAPA 02.06.09 and recommendations from the Idaho Department of Agriculture to minimize the potential for transporting or spreading aquatic invasive species. See the Idaho Department of Agriculture website at <http://invasivespecies.idaho.gov/boaters/>.

This condition appears to be simpler or less burdensome than the alternative condition proposed by the TMD in 2017. This condition could be changed to be consistent with IDEQ § 401 Water Quality Certification for small placer miners in Idaho which states as follows:

Operators must ensure their dredging equipment does not house invasive species. Equipment must be decontaminated prior to its placement in waters of the state. Furthermore, dredging equipment used in multiple streams should be decontaminated before each deployment. Decontamination procedures may be found at: http://deq.idaho.gov/media/457155-decontamination_procedures.pdf

2017 Special Condition 20: *Dredge mining equipment shall not be operated within 500 feet of a developed campground.*

This condition states a requirement of the SFCR Plan (IWRB, SFCR Plan, 2004 at 3-22) and is included on the Special Supplement as a matter of law.

2017 Special Condition 21: *Permittee shall not secure dredge mining equipment by stringing ropes, wires, chain, etc. across the stream channel.*

This condition was initiated in 2016 and continued in 2017. The condition was added to protect public health and safety due to concerns about stringing ropes or wires across the river channel as observed on the SFCR in 2015. Anchoring or tying off dredges and sluices along banks may be acceptable as long as sections of rope, wire, chain, etc. is minimal, does not span the entire stream channel, and does not cause risk or hazard to the public.

2017 Special Condition 22: *This permit does not constitute*
a. An easement or right-of-way to trespass or work upon property or mining claims belonging to others. Access is the responsibility of the permittee to negotiate and obtain permission as needed.
b. Responsibility of the IDWR for damage to any properties due to operations of permittee.

This condition is nearly identical to Condition 6 on the current Letter Permit authorization. The same or similar condition has been used on all Letter Permit authorizations since at least 2000. Part a. of this condition was modified in 2017, in part, based on comments from the TMD.

2017 Special Condition 23: *This permit may be canceled at any time to minimize adverse impact on the stream channel.*

Conditions where this could be likely: very low flows and high temperatures to reduce effects on ecosystem; very high flows for safety of miners and liability concerns.

This condition is necessary to ensure protection of the SFCR and other waterways.

This same or similar condition has been included on all Letter Permit authorizations since at least 2000. The identical condition has been used on Letter Permits since 2010, and a similar condition used on Letter Permits from 2000 to 2009 as follows:

Violation of this or any other condition of this permit may result in cancellation of this permit without further notice in accordance with Rule 45.02, Stream Channel Alteration Rules.

Table 1. Summary of SFCR 2017 Special Supplement Conditions

Special Condition	Special Conditions Analysis	Condition Previously used by IDWR?
<p>1. Dredge mining shall occur only within the wetted perimeter below the mean high water mark (as defined in IDWR Stream Channel Rule 10.08) between July 15, 2017 and August 15, 2017. Activities which would expand the wetted perimeter are not authorized.</p>	<p>Condition limits turbidity, degrading water quality, creation of fines in active channel, degrading substrate quality, noise, and total area of disturbance. July 15-Aug. 15 season is set by the SFCR Plan</p>	<p>Yes: SFCR July 15-Aug 15 season has been standard season since 2001 as per Special Supplement and IDWR dredge mining instructions. Condition language regarding work within wetted perimeter is consistent with Rule 64.04 and applies to all permits statewide</p>
<p>2. Dredge mining cannot occur until IDWR and a state and/or federal fisheries biologist inspect the proposed dredge sites to identify acceptable dredge locations to avoid reducing the quality of migratory, spawning, and holding habitat for salmonids.</p>	<p>Condition allows IDWR to identify key sensitive habitats and discuss avoidance with miner, limits contiguous areas of damaged habitat and limits overall disturbance, ensuring only certain areas are mined disturbance is localized rather than widespread. Inspection is a requirement of the SFCR Plan.</p>	<p>Yes: Similar condition used as standard condition on all SFCR Special Supplements from 2001 through 2009</p>
<p>3. Suction dredges shall have a nozzle diameter of five inches or less and a horsepower rating of 15 horsepower or less. Pump intakes (but not dredge nozzles) must be covered with 3/32-inch mesh screen.</p>	<p>Condition limits turbidity, degrading water quality, creation of fines in active channel, degrading substrate quality, noise, and total area of disturbance. Small screen mesh protects small fish, eggs, and invertebrates, as well as pumps and valves on the dredge itself. Dredge size limits are set by Rule 64.01 and by the SFCR Plan.</p>	<p>Yes & No in part: Dredge size limit of 5 inches or less and engines no more than 15 HP is established by Rule 64.01 and included on all permits (statewide) and IDWR instructions since 2000 and earlier. The 3/32 mesh screen requirement was initiated in 2016.</p>
<p>4. An IDWR SFCR suction dredge ID card shall be attached to the dredge in a visible location at all times the dredge is located on the SFCR.</p>	<p>Attaching the ID card to the dredge in a visible location is evidence that the dredge is operating pursuant to a specific IDWR SFCR permit. It allows staff from IDWR, land management agencies, other miners, and the public, to know the dredge is permitted and can be legally operated.</p>	<p>No: Condition initiated in 2016</p>

Table 1. Summary of SFCR 2017 Special Supplement Conditions

Special Condition	Special Conditions Analysis	Condition Previously used by IDWR?
5. In-stream mining activities shall only take place during daylight hours.	Condition allows unimpeded fish movement and normal behavior at night, minimizes mining early and late in the day when fish primarily feed, reduces mining effort which helps limit sedimentation and total area of disturbance, and limits light and noise disturbance. Dredging normally occurs in daylight hours when water temperature and clarity is greatest.	No: Condition initiated in 2016
6. Dredge mining sites shall consist of a maximum of two separate locations of 150-linear feet each.	Condition creates manageable areas for staff/biologist to identify key sensitive habitats and discuss avoidance with miner, limits contiguous areas of damaged habitat and overall disturbance. Average SFCR dredge site lengths are less than 150 ft. as per recent reporting by USFS.	No: This condition initiated in 2016. However, a standard condition used in 2008 & 2009 SFCR Special Supplement allowed no more than 3 sites with a combined length not to exceed 1,500 feet.
7. Dredged or excavated holes shall be back filled with the same material that was excavated on or before August 15, 2017 (i.e. the last day of the 2017 SFCR dredge mining season).	Dredge holes and tailings piles that are restored to original grade helps to mitigate physical effects of dredging, improves aesthetics and reduces likelihood of altering channels and flow. Holes/piles/boulders can be hazards to boaters and other river users. Holes/piles may alter spawning/rearing habitat, which is a strong limiting factor for salmonid populations.	Yes: Similar condition found as standard condition no. 5 on all Letter Permits (statewide) from 2000 to 2009 and generally cited as follows: "...dredger must remove all tailings piles, replace all depressions, and return any disturbed areas back to their original general configuration"
8. Permittee shall not alter the stream channel in a manner that creates a physical barrier that prevents upstream or downstream fish movement.	Turbidity can cause decreased use or barriers to fish, piled sediment can physically block channels, active mining disturbance can impede fish movements.	Yes in part: Similar condition found as standard condition no. 8c. on all Letter Permits (statewide) from 2000 to 2009 and generally cited as follows: "This permit specifically prohibits ...Damming of a stream channel for any reason."

Table 1. Summary of SFCR 2017 Special Supplement Conditions

Special Condition	Special Conditions Analysis	Condition Previously used by IDWR?
<p>9. Dredge mining shall be excluded in areas within 100 feet upstream and 300 feet downstream of perennial tributaries and shall not hinder fish access to fish-bearing tributary mouths through disturbance, turbidity, or modifications of channel depth or substrate arrangement. If a permittee proposes to dredge mine within 100 feet upstream and 300 feet downstream of a perennial tributary it must be determined acceptable by the IDWR and fisheries biologist during site inspection.</p>	<p>Tributary mouths are areas of diverse habitat, cold and deep water, confluence delta areas often support and contain the most rearing salmonids. Tributaries and confluence areas are movement corridors, staging/holding areas, upwelling and spawning areas. Salmonids often reside in the SFCR throughout summer in or near thermal refugia such as deep pools and cold tributary plumes.</p>	<p>Yes in part: Similar condition found as special condition no. 7 to SFCR Special Supplement 2006 through 2008 cited as follows: "This approval specifically prohibits dredging within 200 feet of the mouth of any stream tributary to the main Clearwater River, SFCR, or main Salmon River as identified under the Special Supplement."</p>
<p>10. Dredge mining shall not occur on gravel bars at the tails of pools. Dredge mining shall not occur in a manner that deposits fine sediment (sand or silt) on gravel bars to a depth of more than ½-inch.</p>	<p>Condition limits amount and depth of fines in/on substrates, which reduces the suffocation of eggs (fish, invertebrates, mussels, and other forage). Deposition of fines and sand contribute to loss of functioning substrate habitat.</p>	<p>Yes in part: Language in this condition regarding sediment deposition no more than 1/2 inch was added in 2016 to help clarify language in IDWR instructions cited as follows: The following three items are required for operating suction dredges to prevent damaging fish populations: 1. Do not operate in the gravel bar areas at the tail of pools. This is the area preferred by trout and salmon for spawning; 2. Do not operate in such a way that discharge of fine sediment from the mining equipment blankets gravel bars.; and 3. Do not change the stream channel in such a way that the current is directed into the bank causing erosion or destruction of the natural form of the channel"</p>

Table 1. Summary of SFCR 2017 Special Supplement Conditions

Special Condition	Special Conditions Analysis	Condition Previously used by IDWR?
<p>11. Dredge mining shall not occur within two feet of stream banks. Permittee shall prevent the undercutting and destabilization of stream banks. Woody debris or boulders that extend from the bank into the channel shall not be disturbed.</p>	<p>Salmon fry often rear in highest densities along stream perimeters, many older juveniles rear/hide in streambanks, high rates of sediment addition to channel cause increased erosion and reduced channel stability.</p>	<p>Yes in part: This condition is consistent with Rule 64.04: "Operation of the dredge shall be done in a manner so as to prevent the undercutting of streambanks." This condition is similar to standard condition 8a used on all Form Letter Permits from 2000 through 2009 prohibiting "disturbance of any vegetated streambank or undercutting of any stream bank areas." Also, special condition to SFCR Special Supplement from 2006 to 2008 prohibited dredging within 15 feet of the waters edge within any eddy.</p>
<p>12. Dredge mining shall not disturb the stream bank and associated habitat, deposit sediment against the bank, cause erosion or destruction of the channel, undercut the bank, or widen the channel.</p>	<p>Salmon fry often rear in highest densities along stream perimeters, many older juveniles rear/hide in streambanks. High rates of sediment or re-distribution of sediment to channels can cause increased erosion and reduced channel stability.</p>	<p>Yes in part: See comments above to Condition No. 11</p>
<p>13. Permittee shall not remove, relocate, break apart or lessen the stability of substantial in-channel woody debris or in-stream boulders (greater than 12 inches median diameter) unless it was determined acceptable by the IDWR and fisheries biologist during site inspection.</p>	<p>Large woody debris and other natural features of structure in channels are important to hydro-geomorphology and ecological function (channel, substrate, hyporheic exchange, physical cover, and food web). Removing or disturbing such features increase adverse impacts to ecosystem that is already cover-limited and substrate-function limited.</p>	<p>Yes in part: This condition is similar to standard condition 8d used on all Form Letter Permits from 2000 through 2009 prohibiting "Removal or relocation of boulders in the streambed or bank. Boulders may be moved to facilitate dredging, but they must be returned to their original location." The wording of this condition was modified slightly between 2000 and 2009. Reference in this 2017 condition no. 13 to boulders greater than 12 inches helps clarify the previously used condition.</p>

Table 1. Summary of SFCR 2017 Special Supplement Conditions

Special Condition	Special Conditions Analysis	Condition Previously used by IDWR?
<p>14. Permittee shall visually monitor the stream for 150 feet downstream of the dredge mining operation. If turbidity is observed more than 150 feet downstream, the operation must cease or decrease in intensity until no turbidity is observable more than 150 feet downstream.</p>	<p>Turbidity limits on dredging reduces area of degraded water quality, habitat, metals contamination, and sedimentation (area and volume) downstream of the dredge.</p>	<p>Yes in part: This condition is more specific than past standard condition no. 3 used in all Letter Permits from 2000 to 2009 cited as follows: "Dredging shall be conducted in a manner such that the return water from the dredge does not significantly increase the turbidity of the stream below the dredging operation or have adverse impacts upon the stream channel, such as channelization."</p>
<p>15. No mechanized equipment shall be operated below the mean high water mark except for the suction dredge, sluice, pump, or any life support system necessary to operate a suction dredge.</p>	<p>Condition nearly identical to Rule 64.03 and excludes use of other mechanized equipment in the channel below the mean high water mark, such as bull dozers, back hoes, jack hammers, winches, and drills etc.</p>	<p>Yes: Condition is same as IDAPA Rule 64.03</p>
<p>16. Permittee must maintain a minimum spacing of at least 800 linear feet of stream channel between active mining operations.</p>	<p>Helps ensure turbidity plumes and sand spits left by single dredges aren't combined into large areas. Spacing condition limits local degradation of water and substrate quality, and limits cumulative degradation of substrate quality.</p>	<p>No: The 800 feet spacing requirement was initiated in 2016. IDEQ § 401 Certification authorizes a 500 foot mixing zone for turbidity. For other streams in state, the minimum spacing between active dredges is 100 feet as per IDAPA Rule 64.06</p>

Table 1. Summary of SFCR 2017 Special Supplement Conditions

Special Condition	Special Conditions Analysis	Condition Previously used by IDWR?
<p>17. All fuel, oil, and other hazardous materials shall be stored outside of the stream channel in containers approved by ANSI or UL for storage of the materials. Permittee shall not operate any equipment that leaks fuel, hydraulic fluid or other pollutants. Permittee shall use a funnel or spill proof spout when pouring fuel and place absorbent material, sufficient to absorb a spill, under and around the fuel tank when refueling. Petroleum absorbent spill kits of suitable size to handle combined fuel volume of all fuel storage containers shall be onsite in case of accidental spills and no petroleum products shall enter the stream when servicing the equipment.</p>	<p>Fuel leakage from dredge or spills into the stream during refueling can reduce water quality. Placement of this condition on the is intended to minimize the risk of water contamination from potential spills. Condition was modified in 2017 based on comments from the Tenmile Mining District (“TMD”).</p>	<p>Yes: A similar standard or general permit condition has been used on all Letter Permits from 2000 to 2017 although language has changed slightly over time. This 2017 condition for the SFCR was modified based on comments from SFCR dredge operators.</p>
<p>18. Permittee shall not entrain, mobilize or disperse any mercury discovered during mining operations. Permittee shall not use mercury, cyanide or any other hazardous or refined substance to recover or concentrate gold.</p>	<p>Condition intended primarily to be consistent with IDAPA 58.01.02.800 prohibiting storage or disposing of hazardous materials to or near state waters.</p>	<p>No: Condition added/initiated in 2016.</p>
<p>19. To prevent the threat of aquatic invasive species, suction dredges, tools used while dredging and associated equipment shall be thoroughly cleaned and dried at least 5 days prior to use in the SFCR.</p>	<p>Placement of this condition on the SFCR Special Supplement is intended to minimize the risk of transporting or spreading aquatic invasive species.</p>	<p>No: Condition added/initiated in 2016. However, this condition is consistent with IDAPA 02.06.09 and recommendations from the Idaho Department of Agriculture to minimize the potential for transporting or spreading aquatic invasive species.</p>
<p>20. Dredge mining equipment shall not be operated within 500 feet of a developed campground.</p>	<p>Required by SFCR Basin Plan</p>	<p>No: This condition has not been included in the SFCR Supplement until 2016 but this condition is a requirement of the IWRB SFCR Plan.</p>

Table 1. Summary of SFCR 2017 Special Supplement Conditions

Special Condition	Special Conditions Analysis	Condition Previously used by IDWR?
21. Permittee shall not secure dredge mining equipment by stringing ropes, wires, chain, etc. across the stream channel.	Condition intended to protect public health and safety due to concerns about stringing ropes or wires across the river channel.	No: Condition added/initiated in 2016 for public safety purposes to promote safety for other recreational river uses and users.
22. This permit does not constitute a. An easement or right-of-way to trespass or work upon property or mining claims belonging to others. Access is the responsibility of the permittee to negotiate and obtain permission as needed. b. Responsibility of the IDWR for damage to any properties due to operations of permittee.	Condition is nearly identical to Condition 6 on the current Letter Permit authorization. The same or similar condition has been used on Letter Permit authorizations since at least 2000. Part a. of this condition was modified in 2017, in part, based on comments from the TMD.	Yes: This same or similar condition found as standard condition no. 2 on all Letter Permits (statewide) from 2000 to 2009, and condition no. 6 on all Letter Permits since 2010.
23. This permit may be canceled at any time to minimize adverse impact on the stream channel.	Condition could be utilized during very low flows and high temperatures to reduce effects on ecosystem, very high flows for safety of miners and liability concerns, or when compliance or enforcement issue exists.	No: This specific condition added in 2016, but all Letter Permits since 2010 include a conditions stating that "this permit may be canceled at any time to minimize adverse impact on the stream channel." Also, all letter Permits from 2000 to 2009 included a condition stating that a violation of any permit condition "may result in cancellation of this permit without further notice in accordance with Rule 45.02, Stream Channel Alteration Rules."

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