

Abbreviated Preliminary Assessment for Pearl Area Mines

(aka Smith Mine; Black Pearl Mine [aka Red Warrior Lode, Leviathan Lode]; Middleman [aka J.I.C. Group, Leviathan Lode, Mormon City]; Sacramento [Aspen Mine]; and Golden Chest Prospect)

Gem County



**State of Idaho
Department of Environmental Quality**

December 2017

Acknowledgments

DEQ would like to thank Kathleen Cunningham for permitting access to her property.

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Introduction

This abbreviated preliminary assessment (APA) for the Pearl area mines in the West View Mining District, Gem County, Idaho provides the rationale for the No Remedial Action Planned (NRAP) determination that no additional assessments or site inspections are necessary at this time. This APA follows the format and guidelines of the U.S. Environmental Protection Agency (EPA) *Abbreviated Preliminary Assessment Checklist* (EPA 1999).

Section 1 provides the APA checklist filled out by the assessor to determine that an APA was warranted. The following sections contain additional relevant information and evidence to support the APA, including health and safety information (Section 2), historical and geologic information (Section 3); maps (Section 4); current site conditions and photographs (Section 5); and references (Section 6). During this assessment, the Idaho Department of Environmental Quality (DEQ) used references from historic reports which often have different spellings for claim names, town sites, and/or geographic features. DEQ has retained the spelling from the original source document.

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Date of Site Inspection: 6/16/2017

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Site Name: Pearl Area Mines

Previous Names (aka): Smith Mine; Black Pearl Mine (Red Warrior Lode, Leviathan Lode); Middleman (J.I.C. Group, Leviathan Lode, Mormon City); Sacramento (Aspen Mine); and Golden Chest Prospect

Site Owner: Kathleen Cunningham

Site Location: The Pearl area mines are accessible by vehicle. From Boise go west on State Street, turn right on Highway 55 toward Horseshoe Bend for 12.3 miles, turn left on Pearl Road for 4.6 miles to Pearl, Idaho. Property owner allows access to mining sites.
 Township 6 North, Range 1 East, Sections 14 and 15

Mine Site	Latitude	Longitude
Smith Mine	43.854233°N	-116.310516°W
Black Pearl Mine	43.851283°N	-116.306396°W
Middleman	43.852073°N	-116.302625°W
Sacramento	43.850933°N	-116.308316°W
Golden Chest Prospect	43.856287 N	-116.321133 W

Description of release (or potential release) and its probable nature:

The Pearl area mines were investigated by DEQ on June 16, 2017 for potential releases of heavy metals or other deleterious materials (such as petroleum products and ore processing chemicals) by surface water, soil exposure, ground water or air pathways. Historical and geological information available for this site is summarized in Section 3, including commodities and approximate ranges of production. Photographs showing the current conditions of several mine waste rock piles are shown in Section 5.

Section 1. APA Checklist

Task 1—Superfund Eligibility Evaluation

Assessor, if all answers are “no,” continue to task 2; otherwise, explain any “yes” answers below and then skip to task 3.

	YES	NO
1. Is the site currently in the Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) or an “alias” of another site?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2. Is the site being addressed by some other remediation program (i.e., federal, state, or tribal)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3. Are the hazardous substances that may be released from the site regulated under a statutory exclusion (e.g., petroleum, natural gas, natural gas liquids, synthetic gas usable for fuel, normal application of fertilizer, release located in a workplace, naturally occurring, or regulated by the Nuclear Regulatory Commission, Uranium Mill Tailings Radiation Control Act, or Occupational Safety and Health Administration)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4. Are the hazardous substances that may be released from the site excluded by policy considerations (i.e., deferred to Resource Conservation and Recovery Act corrective action)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5. Is there sufficient documentation to demonstrate that there is no potential for a release that constitutes risk to human or ecological receptors (e.g., comprehensive remedial investigation equivalent data showing no release above applicable or relevant and appropriate requirements (ARARs), completed removal action, documentation showing that no hazardous substance releases have occurred, or an EPA-approved risk assessment)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Assessor, please explain all “yes” answer(s):

Regarding question 5: A reconnaissance level preliminary assessment was conducted to determine if any potential sources or associated releases could be identified due to historical mining practices. No concerns were identified during desktop research. Also, no concerns with past mining activities or evidence of other hazardous or deleterious materials were observed during the June 16, 2017 site inspection. Soil and waste rock samples were not collected because waste piles were relatively small (did not appear to exceed 1,500 cubic yards in volume) or were located on property where access was not granted. In addition, the waste rock piles were not observed to be actively eroding into nearby surface water and/or were well vegetated and not creating fugitive dust. Surface water and sediment samples were not collected because none of sites had evidence of erosion or drainage from the piles.

Task 2—Initial Site Evaluation

If information is not available to make a “yes” or “no” response below, further investigation may be needed. In these cases, the assessor should determine whether an APA is appropriate.

If the answer is “no” to any of questions 1, 2, or 3, proceed directly to task 3.	YES	NO
1. Does the site have a release or a potential to release?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2. Does the site have uncontained sources containing CERCLA-eligible substances?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3. Does the site have documented on-site, adjacent, or nearby targets?	<input checked="" type="checkbox"/>	<input type="checkbox"/>

If the answers to questions 1, 2, and 3 above were all “yes,” then answer questions 4–7 before proceeding to task 3.	YES	NO
4. Does documentation indicate that a target (e.g., drinking water wells, drinking surface water intakes, etc.) has been exposed to a hazardous substance released from the site?	<input type="checkbox"/>	<input type="checkbox"/>
5. Is there an apparent release at the site with no documentation of exposed targets, but targets are on site or immediately adjacent to the site?	<input type="checkbox"/>	<input type="checkbox"/>
6. Is there an apparent release and no documented on-site targets or targets immediately adjacent to the site, but targets are nearby (e.g., within 1 mile)?	<input type="checkbox"/>	<input type="checkbox"/>
7. Are there uncontained sources containing CERCLA hazardous substances, a potential to release with targets present on site or in proximity to the site, but no indication of a hazardous substance release?	<input type="checkbox"/>	<input type="checkbox"/>

Notes:

At the time of the site inspection, no releases or potentials for release were identified and no current disturbances of past mining areas or waste rock piles were observed. Current land uses include cattle ranching and recreational activities. The sites are located on private property and access to some areas is restricted by a locked gate. The site is maintained by the property owner. Potential risks to human or ecological receptors associated with this area are minimal. If future land uses include residential development, further characterization of development areas in relation to the waste rock piles, former working areas, and other historic mining features should be performed.

Table 1 parallels the questions above and should be used by the assessor to make decisions during task 3. Table 1 identifies different types of site information and provides some possible recommendations for further site assessment activities based on that information. The assessor should use Table 1 in determining the need for further action at the site, based on the answers to the questions in task 2. Assessors should use professional judgment when evaluating a site. An assessor’s individual judgment may be different from the general recommendations for a site given below.

Table 1. Site assessment decision guidelines for a site.

Suspected/Documented Site Conditions	EPA-Recommended Site Assessment Activities
1. There are no releases or potential to release.	APA
2. No uncontained sources with CERCLA-eligible substances are present on site.	APA
3. There are no on-site, adjacent, or nearby targets.	APA
4. There is documentation indicating that a target (e.g., drinking water wells, drinking surface water intakes, etc.) has been exposed to a hazardous substance released from the site.	APA → SI or PA/SI
5. There is an apparent release at the site with no documentation of exposed targets, but there are targets on site or immediately adjacent to the site.	APA → SI or PA/SI
6. There is an apparent release and no documented on-site targets and no documented targets immediately adjacent to the site, but there are nearby targets. Nearby targets are those targets that are located within 1 mile of the site and have a relatively high likelihood of exposure to a hazardous substance migration from the site.	Full PA
7. There is no indication of a hazardous substance release, and there are uncontained sources containing CERCLA hazardous substances, but there is a potential to release with targets present on site or in proximity to the site.	Full PA

Task 3—DEQ Site Assessment Decision

When completing task 3, the assessor should use task 2 and Table 1 to select the appropriate decision. For example, if the answer to question 1 in task 2 was “no,” then an APA is appropriate and the “NRAP” box below should be checked. Additionally, if the answer to question 4 in task 2 is “yes,” then two options are available (as indicated in Table 1): (1) proceed with an APA and check the “Lower Priority SI” or “Higher Priority SI” box below or (2) proceed with a combined PA/SI.

Check the box that applies based on the conclusions of the APA checklist:

- No Remedial Action Planned (NRAP)
- Higher Priority SI
- Lower Priority SI
- Refer to RCRA Subtitle C
- Refer to NRC
- Refer to Removal Program – further site assessment needed
- Refer to Removal Program – NFRAP
- Site is being addressed as part of another CERCLIS site
- Other: _____

DEQ Preparer:

Dana Swift

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12-19-2017

Date

Please explain the rationale for your decision:

As a result of DEQ's research and site observations, a NRAP designation is recommended for the Pearl area mines. Supporting information is included in the following sections.

Section 2. Health and Safety Information

The current land uses include cattle ranching and recreational activities. Full time residential living is located in areas not immediately impacted by past mining activities. If future land uses include residential development, further characterization of development areas in relation to the waste rock piles, former working areas, and other historic mining features should be performed.

It is not unusual for historic mining areas to have high levels of metals. These metals can get into your body in several ways: recreating or playing in contaminated soil, putting your hands or other objects covered with dust into your mouth, and breathing in contaminated dust. Persons recreating in this area should be aware of the hazards of historic mining areas, especially health risks associated with prolonged exposures to metals. A summary of health and safety information includes:

- Do not camp or recreate near old mining structures or mining waste piles or dumps.
- Wash hands after any outdoor activity and before eating or drinking. Use a nail scrub brush to get dirt out of fingernails.
- Do not let children play in loose soil, dust, and muddy areas.
- Keep children's cuts and scrapes clean and covered.
- Wash children's toys after playing outside.
- Eat on a clean table or blanket, not on the ground. Do not eat food that has been dropped on the ground.
- When returning home, remove shoes, dust off clothing, and wash separately from other laundry.
- Stay out of old mine adits and structures. Rotting wood, unstable rock, oxygen-depleted air, falling debris, dust, and mining wastes are potential dangers. Stay out and stay alive.

Section 3. Historical and Geologic Information

The Idaho Geological Survey (IGS) lists the following commodities and approximate ranges of production summarized from historical information:

Mine Site	Commodities (Production)
Smith Mine	copper, gold, lead, silver, zinc
Black Pearl Mine	copper (501-1,000 lbs) gold (1,001-5,000 oz) lead (101-500 lbs) silver (1,001-5,000 oz) zinc
Middleman	copper (1,001-5,000 lbs) fluorite gold (101-500 oz) lead (10,001-50,000 lbs) silver (1,001-5,000 oz) zinc (5,001-10,000 lbs)
Sacramento	gold
Golden Chest Prospect	gold, zinc

DEQ cannot improve or expand upon geologic information included in historic reports; therefore, information from these reports is included as direct quotations. The following information is quoted directly from *Geology of the Pearl-Horseshoe Bend Gold Belt, Idaho* (Anderson 1934):

Black Pearl

The Black Pearl joins the Leviathan on the east about a mile southeast of Pearl. The mine was opened through a vertical shaft about 400 feet deep sunk in the valley bottom and from it between 5,000 and 10,000 feet of drifts had been driven, mainly from three crosscuts. The shaft is now closed and none of the workings is accessible except some surface cuts and shallow shafts on the hill slope to the south. There has apparently been no work on the property for many years except on the croppings, and the mill has long been dismantled. Nothing was learned about the past production, although the mine was worked at intervals until the increasing baseness of the ore made gold recovery difficult and unprofitable.

Three lodes cross the property, each of which strikes about N. 80° W. and dips about 50° to 80° N. Two of these are the Leviathan and the Red Warrior. All are in the Jurassic (?) quartz diorite in the vicinity of dacite porphyry dikes and are not far from an erosional remnant of basalt and from a cover of Payette beds and overlying rhyolite. The Red Warrior was encountered about 300 feet from the shaft, but the development was largely confined to the second of the three lodes, the Leviathan. These lie well within the mineral belt.

The Leviathan is much the same as in the adjoining properties on the west, and the other lodes are reported to be not unlike the Leviathan. One of the lodes is well exposed in the side of an abandoned shaft on the hill slope. It consists of about 3 feet of fractured and altered granitic rock with iron-stained quartz seams or iron-stained seams alone lying above a band of hard gouge. Unoxidized ore on the dump consists largely of sulphides and some of the fragments are from seams as much as 8 inches thick.

The ore on the several dumps is composed largely of arsenopyrite with a scant quartz gangue and variable but minor amounts of other sulphides, also a little dolomite and calcite. Some of the quartz is coarse and

drusy, but part is fine-grained and dense. It is reported that the ore from the Leviathan contained less lead and zinc than from the other lodes on the property.

Old assay records show that the mill heads consistently averaged about 0.60 ounce of gold per ton or better, and that sorted ore often contained more than an ounce of gold per ton. Assays of picked samples of narrow sulphide seams selected for this report gave 1.16 ounces gold and 2.5 ounces in silver per ton on a quartz-pyrite-arsenopyrite seam and 0.62 ounce gold and 4.0 ounces in silver on ore composed largely of arsenopyrite with a little sphalerite and galena.

Large ore reserves are reported to have been blocked out, but left unmined because of inability to make satisfactory recovery of the gold.

Smith

The Smith property lies a short distance above Pearl on the north side of Willow Creek across from the Leviathan or Whitman mine. The property has been developed during recent years and was active during 1933. It has three tunnels, two at creek level and one higher on the slope, aggregating more than 700 feet of workings. Some hand-sorted ore has been shipped.

The property has several small lodes, each in the Jurassic (?) quartz diorite. These lodes are comparatively narrow, strike N. 70° W. to N. 85° W., and dip mostly north. The lowest crosscut is about 310 feet long and exposes three lodes. One in the face is very lightly mineralized and was followed by drifts for only 45 feet. The fissuring is very prominent and the width of crushed and fractured rock ranges from 10 inches to 5 feet. The fissure strikes N. 85° W. and dips 50° N. The rock in its course shows little hydrothermal alteration and contains very little ore. The main lode lies to the south and was cut about 240 feet from the portal and drifted on for 150 feet. It strikes N. 70° W. and dips 70° N. The lode splits about 100 feet from the crosscut. It is more or less lightly mineralized throughout, but the main ore shoot is at the split. Another small lode lies 10 feet to the south of the middle lode.

Much of the ore that has been mined is from the adit and drifts higher on the creek. There the fissuring strikes N. 85° W. and dips steeply south, but in the ore shoot the dip changes to steeply north. The ore shoot is 15 feet long on the strike and about 4 feet thick, but the winze had only been sunk about 14 feet.

The ore consists largely of quartz and sulphide stringers and seams in the fissured rock. In the main lode in the first tunnel the quartz seams and stringers are from 4 to 8 inches thick with scant to moderate amounts of arsenopyrite and locally small lenses or nests of sphalerite, galena, dolomite, and calcite. Galena and sphalerite occur in considerable quantity in the shoot at the split in the lode. The small lode in the footwall has 2 to 10 inches of quartz, pyrite arsenopyrite, and a little sphalerite. The ore shoot in the drift from the second tunnel has less quartz and is composed of more compact sulphides, mainly steel-gray sphalerite and sphalerite, with only minor amounts of pyrite, arsenopyrite, chalcopyrite, tetrahedrite or tennantite, dolomite, and calcite. The hand-sorted ore is reported to have yielded about \$80 per ton.

The following historical and geological information is quoted directly from the U.S. Geological Survey 18th Annual Report Part III *The Mining District of the Idaho Basin and Boise Range, Idaho* (Lindgren 1898):

THE ORE DEPOSITS.

General Character.

The gold deposits in the Willow Creek and Rock Creek districts are fissure veins of somewhat varying character. Most of them occur in a belt parallel to that of the porphyry dikes, extending in a northeasterly direction, and being in no place much over 1 mile in width. The veins at Willow Creek are most frequently entirely in the dioritic granite. Sometimes a vein follows a porphyry dike for some distance in foot or hanging, but rarely for a long distance. Again, a vein may cut through a dike, in which case it often splinters up. The porphyry dikes are evidently all older than the veins. The fissures which carry gold strike east-west or northeast-southwest. In the Willow Creek district the dip is always to the north from 45° to 80°

and the direction east-west, but toward Rock Creek the direction gradually changes to northeast-southwest. Toward Horseshoe Bend the direction changes again to east-northeast to west-southwest, and the dip is frequently steep to the south. The individual veins can rarely be traced for a long distance, and though it is probable that some of the veins are a mile long, this can rarely be satisfactorily proved. Narrow veins predominate in the Willow Creek district, while wider deposits occur on Rock Creek. The best exposures are however, found in the former district owing to more extensive development. In Rock Creek the developments are relatively slight, and the decomposed surface material does not always allow satisfactory conclusions as to the character of a deposit. A large number of locations have been made in both districts, which, in fact, contain a very great number of veins. The ordinary type of the Willow Creek deposits consists of one or more fault fissures, on both sides of which there is a zone a few feet wide in which the country rock has been thoroughly altered (see Chapter II) and impregnated with pyrite. Along the main fissure, or, if there are two or more, chiefly along the foot wall, there are narrow seams filled with sulphides (pyrite, zinc-blende, arsenopyrite, and galena), which constitute the ore. The altered country rock, though often studded with pyrite crystals, usually contains only \$1 or \$2 in gold, while the value of the solid sulphides in the seams may reach \$100 per ton or more. The deposit may thus be characterized as narrow veins of high-grade sulphide ore. There is usually but little gangue along these seams; calcite and quartz both occur. In other deposits the zone of altered diorite or granite is traversed irregularly by numerous small seams carrying arsenopyrite, blende, and galena, and in this manner the wider deposits of medium-grade ore are formed. The veins of Rock Creek are generally steeper than those of Willow Creek.

The surface decomposition attains 50 to 100 feet in depth. In this zone the vein matter forms a brown ferruginous mass, which contains free gold and partly decomposed sulphides, often also lead carbonate. In many cases the fresh sulphide ore is found less than 50 feet from the surface. The fresh ore contains a very small percentage of free gold, and sometimes, in rich ore, not even a color is obtained by the pan. It follows from this that the amalgamation process is, as a rule, applicable only to the surface ores, though some veins will be found to contain more free gold than others. At present the rich ore—all above \$30—is sacked and shipped to smelters.

The minerals consist of the following combination, so common in the Boise Ridge: pyrite, arsenopyrite, zinc blende, and galena; chalcopyrite is rare. The first two often occur as crystals. The zinc blende is black, brown, or greenish-yellow, usually not crystallized. The galena is less common than the others, and is considered an indication of rich ore. Ruby silver is reported as a rarity from the Shamrock and the Lincoln.

Shipping ore often contains 5 ounces of gold and 5 ounces of silver to the ton. A sample of pyrite, arsenopyrite, and galena from one of the best mines gave 0.85 ounce of gold and 28.35 ounces of silver per ton, a total of \$37.42. Some galena carries 60 to 70 ounces of silver, and generally also much gold. Much of the arsenopyrite and zinc blende is poor. The principal value appears to be in the pyrite and galena. Of the extent and direction of the ore shoots but little is known at present, but it is clear that the high-grade shoots are not of great lateral extent and that they are rather irregular.

Treatment of the Ores.

At present only the shipping ores can be utilized, and the question now to make \$10 to \$20 ore pay is one of the greatest importance to the camp. If it should contain any notable amount of free gold, amalgamation and concentration will probably be found most economical. Experiments should be made as to the applicability of the cyanide process to these ores. In the absence of notable amounts of copper and antimony the process might be of advantage, but experiments are necessary to prove this.

Detailed Description.

The Lincoln vein is one of the most westerly locations in Willow Creek, being situated about a mile south-southwest of Pearl. The strike is N. 76° W. and the dip steep to the north, the vein being traceable in granite for a distance of one-fourth mile, with good ore at close intervals. The tunnel shows 2 to 10 feet of altered and pyrite granite, with smaller streaks and veins (1 to 6 inches wide) of pyrite, arsenopyrite, and blende, associated with a little drusy quartz; ruby silver has been noted. The developments consist of a crosscut tunnel 200 feet long, with drifts on the vein, and a small winze. Fifteen tons of ore were shipped, averaging

\$100. A sample of poor ore gave 0.1 ounce of gold and 5.30 ounces of silver, a relatively large amount of silver for this camp.

The Shamrock is situated a few hundred feet southwest of Pearl post-office, and is developed by an 80-foot crosscut from the creek level, from which drifts extend on the vein. The country rock is very much disturbed granite containing rich but irregular seams of ore. Some tons of the latter were shipped to smelters.

The Pinto lies a short distance north of the Bishoprie mill, in Pearl, and has been opened by 225 feet of tunnels and a 50-foot winze. Sixty tons of ore are said to have been milled, yielding \$23 per ton. The vein is about 2 feet wide. The Pearl claim, showing some very good ore, is located in this vicinity.

The Dynamite, said to be the extension of Pinto, is situated on the north side of Willow Creek, a short distance east of Pearl, the croppings being 250 feet above the stream. The vein is opened by a tunnel 200 feet long, strikes N. 68° W. and dips 45° N., and shows 16 inches of decomposed vein-matter in granite. A large porphyry dike lies close by to the north.

The Easter lies very nearly in the continuation of the Dynamite, and is one of the producing veins of the district. The croppings lie in granite 250 feet above the creek and the vein is developed by a tunnel 100 feet below the croppings. Another tunnel was started at the creek level, but has not yet reached the vein, work being suspended in 1896 on account of litigation. A considerable amount of ore was stoped and milled in 1895. The vein strikes N. 81° W., dips 60° N., and shows 2 to 3 feet of decomposed vein matter which, in the pay shoot, yielded, it is said, \$38 per ton of free gold. Pockets carrying extremely rich ore occurred at intervals. On the west side the vein is said to splinter up in a porphyry dike.

The Iron Dollar is located a short distance east of the Easter, and is probably the continuation of the same vein. The development consists of short tunnels and surface cuts. A few tons have been milled, yielding \$58 in free gold. The vein, which strikes N. 71° W. and dips 60° N., lies in granite with occasional porphyry dikes in the hanging wall. The decomposed ore consists of altered granite, with streaks of arsenopyrite, pyrite, and galena, as well as a little calcite and quartz. A sample of good ore gave 2.50 ounces of gold and 7.15 ounces of silver to the ton, a total of \$56.68.

The Judas lies a few hundred feet north of the Iron Dollar, and is at present (1897) being developed by a shaft intended to reach a depth of 400 feet. Excellent ore is reported to have been milled from this vein. The strike and dip are nearly the same as in the Iron Dollar, and the vein shows from 1 to 2 feet of decomposed granite carrying rich seams.

The Checkmate crops in granite on the south side of Willow Creek, due south of the Judas. This vein is one of the productive properties, shipping ore during the whole summer of 1896. It is reported that 300 tons, averaging \$80 per ton, have been shipped. The mine is developed by a tunnel 100 feet long on the level of the creek, giving about 100 feet of backs. The deposit consists of a zone several feet wide of altered and pyritic granite, containing rich seams of heavy sulphides, arsenopyrite, pyrite, blende, and galena. At the time the mine was visited most of the ore came from a seam of solid sulphides 4-6 inches wide. The strike is N. 84° W.; the dip to the north.

A short distance east of the Checkmate is the Silver Spray, from which some good ore has been shipped. The vein is opened by a short tunnel, and strikes east-west, dipping 40 N. The country rock is dioritic granite, with streaks of dark diorite and dikes of diorite-porphyrity. The character and the minerals are similar to the Checkmate.

A little farther east is the Golden Chest, showing a wide zone of altered and pyritous granite with narrow seams of zinc blende.

South of Willow Creek, opposite the last-named claim, lies the Red Warrior, the oldest location in the district. No work was done on it in 1896.

One mile southeast of Pearl, on the summit of a ridge, lies the Leviathan claim. This is developed by a shaft 75 feet deep, and a few tons of rich ore have been shipped. The width of the mineralized granite is 13 feet, with seams of pay ore on both walls. In the continuation of this claim lie the Middleman and the Sacramento, which have the same east-west strike. Both of these claims have shipped some rich ore containing much galena. The pure galena assays 8 ounces of gold and 67 ounces of silver to the ton. The developments are slight.

Section 4. Maps

The Pearl area mines are located in Gem County approximately 25 miles northwest of Boise, Idaho (Figure 1). Specific site location details are included in the above checklist. The generalized geology of this area is shown in Figure 2 with a description included in Section 3 of this report.

Using Smith Mine as the center point, Figure 3 shows the surface water, public water systems, domestic wells, and wetlands within a four mile radius of the mine sites. There are no public water systems and 102 domestic wells within the four mile radius of the mine sites. There are numerous wetlands within the four mile radius of the mines. The potential for exposure from ground water and surface water pathways is minimal.

Based on ownership and property boundaries obtained from the parcel maps for Gem County (Idaho State Tax Commission 2017), the nearest residential dwelling belongs to the property owner and is located 0.10 mile from Smith Mine. Also, there are a few other residential dwellings within the four mile radius. Occupancy and duration of occupancy of these residences is unknown. No schools or day care facilities are known to be located within four miles of the mine sites.

All of the mine waste remaining appears to be waste rock from underground workings. The waste rock piles were surrounded by vegetation and limited erosion was observed; therefore, fugitive dust from the piles is likely limited. Some remnants of old buildings and trash were observed around the sites. Current land uses include cattle ranching and recreational activities. Overall, the potential for exposure from the soil and air pathways is minimal.

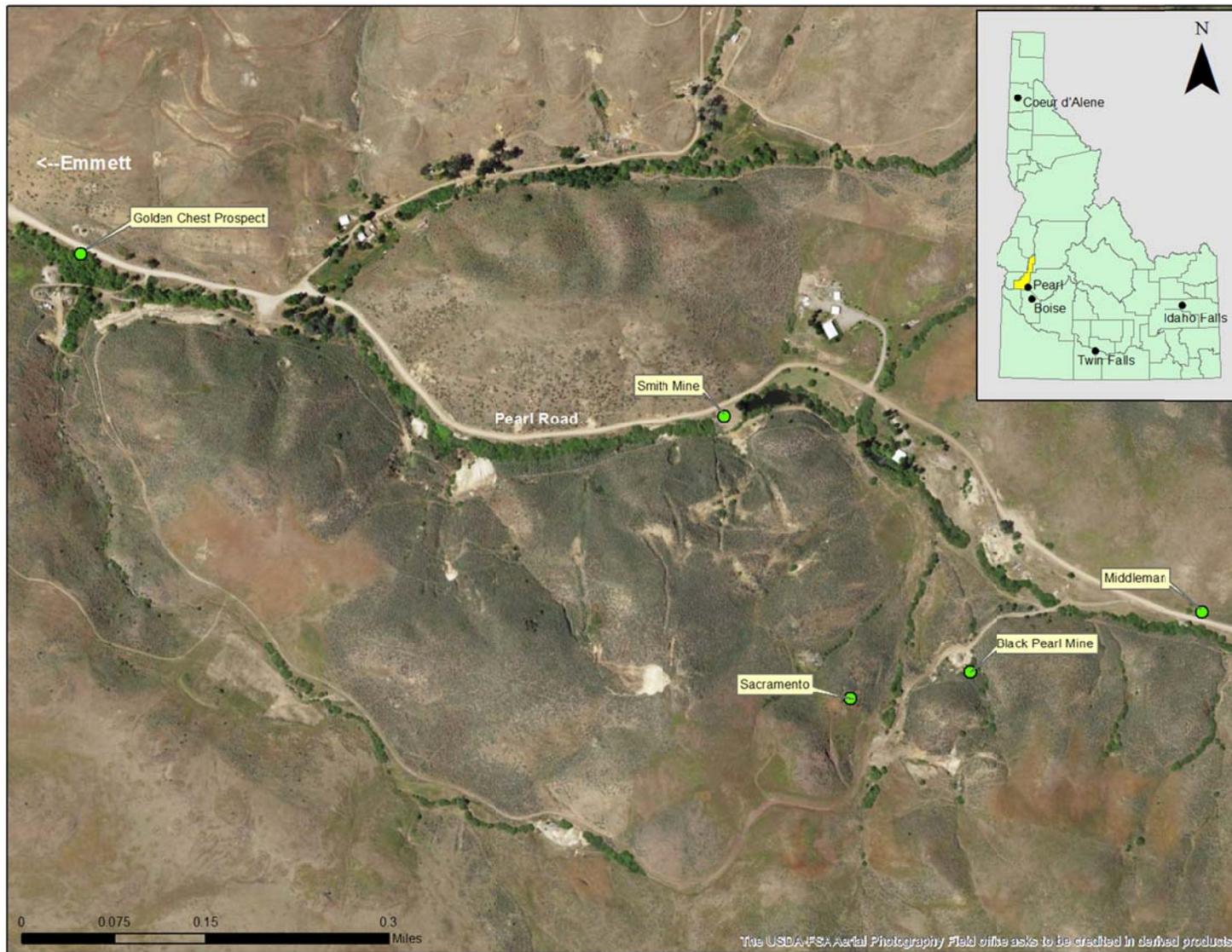


Figure 1. Aerial overview map of the Pearl area mines in Gem County, Idaho.

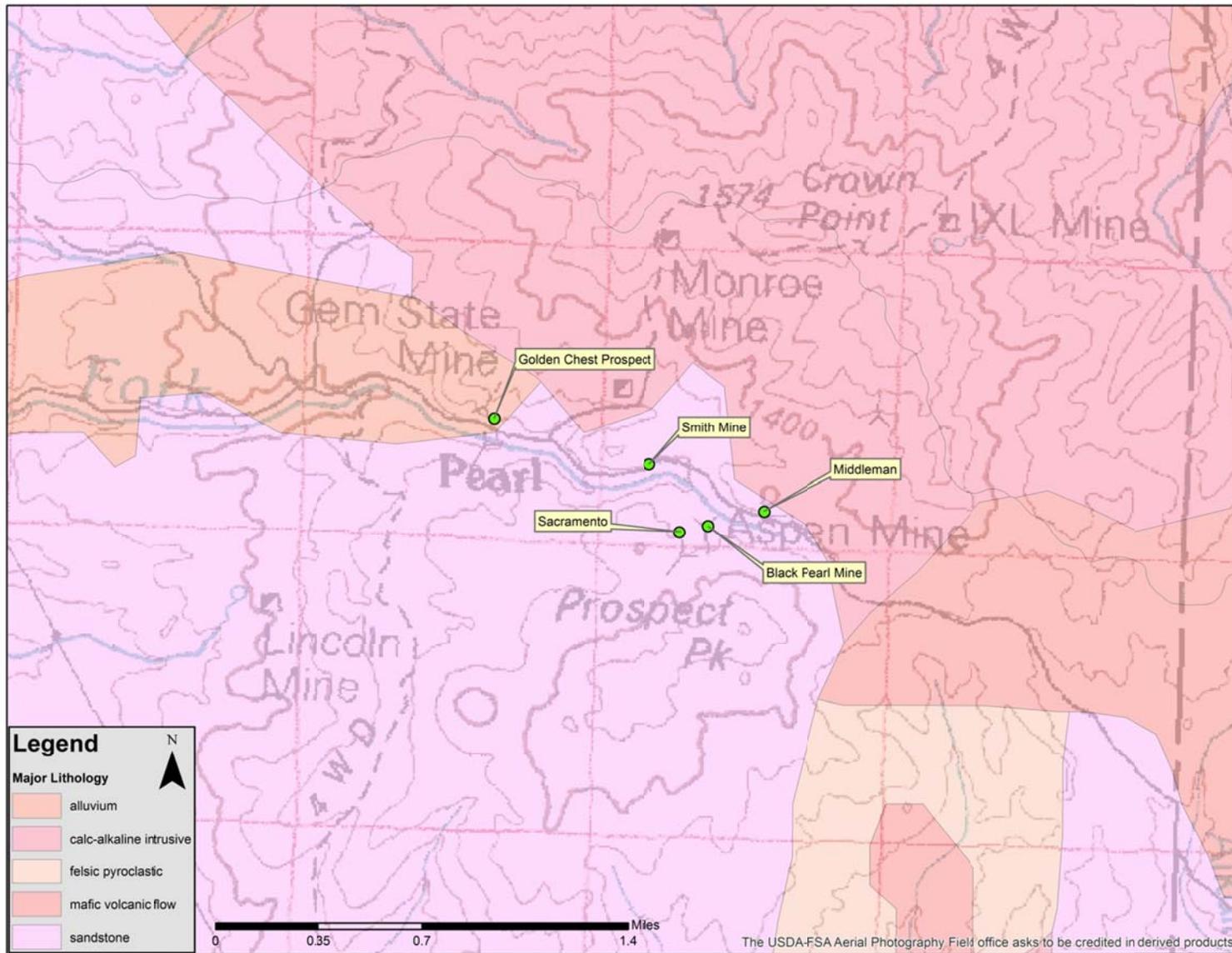


Figure 2. Map of major lithology in the vicinity of the Pearl area mines.

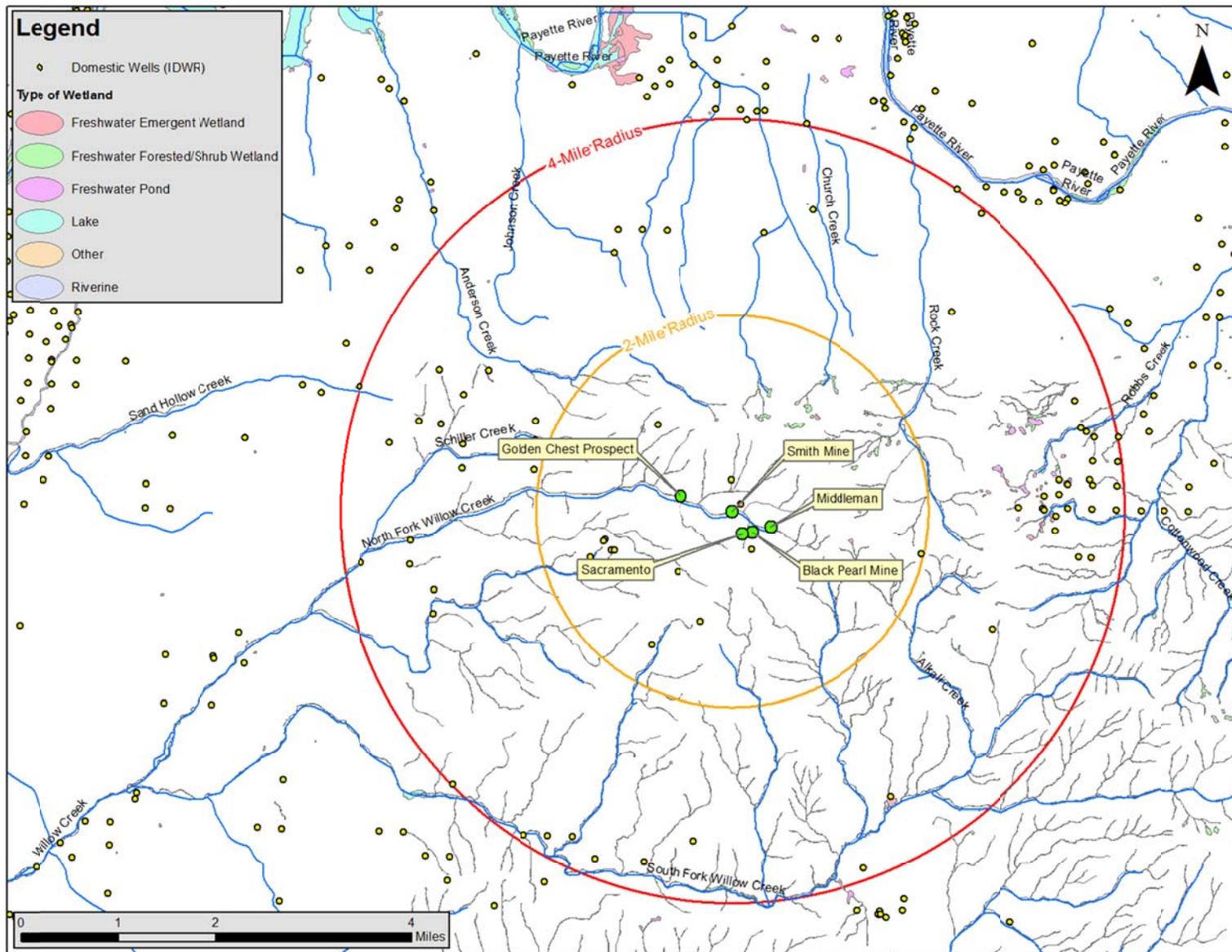


Figure 3. Map of features supporting evaluation of the surface water and ground water pathways and wetlands in the vicinity of the Pearl area mines.

Section 5. Current Site Conditions and Photographs

Observations and photographs of the Pearl area mines were collected during the DEQ site inspection on June 16, 2017. Soil and waste rock samples were not collected because waste piles were relatively small (did not appear to exceed 1,500 cubic yards in volume) or were located on property where access was not granted. In addition, the waste rock piles were not observed to be actively eroding into nearby surface water and/or were well vegetated and not creating fugitive dust. Surface water and sediment samples were not collected because none of sites had evidence of erosion or drainage from the piles.



Photo 1. Golden Chest Prospect, pile on north side of road is well vegetated, no mineralization, no erosion, looking northeast.



Photo 2. Pile on south side of road, across from Golden Chest Prospect. Property surrounded by fencing and no access was granted for this site, looking south.



Photo 3. Smith Mine, looking southeast.



Photo 4. Sacramento Mine, possible shaft opening, looking west.



Photo 5. Sacramento Mine, waste pile with larger rock, no erosion, looking east.



Photo 6. Sacramento Mine, top of pile, looking south.



Photo 7. Sacramento Mine, possible shaft location.



Photo 8. Unmarked mine location, denuded hillside across road from Sacramento and south of Black Pearl Mine, looking east.



Photo 9. Unmarked mine location, small pile, no erosion, no mineralization, looking south.



Photo 10. Unmarked mine location, small pile, no erosional features, looking south.



Photo 11. Black Pearl Mine, closeup of small mineralized area of pile.



Photo 12. Black Pearl Mine, possible shaft headframe remnants.



Photo 13. Natural erosion on hillside area south of Black Pearl Mine dump, looking east.



Photo 14. Black Pearl Mine, waste pile, looking southeast.



Photo 15. Black Pearl Mine, waste pile, looking southwest.



Photo 16. Landscape overview of Black Pearl and Sacramento Mines, looking south.



Photo 17. Middleman Mine, well vegetated waste pile, looking southeast.

Section 6. References

- Anderson, A.L. 1934. *Geology of the Pearl-Horseshoe Bend Gold Belt, Idaho*. Idaho Bureau of Mines and Geology, University of Idaho, Moscow, Idaho, Pamphlet No. 41.
- EPA (U.S. Environmental Protection Agency). 1999. *Abbreviated Preliminary Assessment Checklist*.
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- Lindgren, Waldemar. 1898. The Mining District of the Idaho Basin and Boise Range, Idaho. U.S. Geological Survey 18th Annual Report Part III. p. 712-716.