

# NI 43-101 TECHNICAL REPORT

On the

Katey and Mahogany Properties,

Malheur County, Oregon, United States

For Headwater Gold Inc. By Derrick Strickland P.Geo. December 27, 2020



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# **1 SUMMARY**

This report was commissioned by Headwater Gold Inc. ("Headwater" or the "Company") and prepared by Derrick Strickland, P. Geo. As an independent professional geologist, the author was asked to undertake a review of the available data, and recommend, if warranted, specific areas for further work on the Mahogany Property and Katey Property (or the "Properties"). This technical report was prepared to support a non-offering prospectus for the Canadian Securities Exchange (the "CSE") and summarize the geological features of the Katey and Mahogany Properties.

The Katey and Mahogany Properties are located in Malheur County, Oregon, United States and are composed of 224 unpatented lode claims totaling 4,551 acres in two separate blocks that are 30 km apart from each other. The Mahogany Property ("Mahogany") comprises 139 unpatented lode claims totaling 2,795 acres, centered at 43.26° Latitude and -117.04° Longitude. The Katey Property ("Katey") is 85 unpatented lode claims totaling 1,756 acres, centered at 43.42° Latitude and -117.16° Longitude. The 224 unpatented lode claims are registered to CP Holdings Corporation, a wholly owned United States subsidiary of Headwater Gold Inc. The author visited the Mahogany Property on October 16, 2020. The author visited the Katey Property on October 17, 2020.

Gold mineralization on the Properties is interpreted to be related to hot spring-type low sulphidation epithermal systems of Miocene age. Alteration, mineralization, and geochemical anomalies are associated with high-angle extensional faults. The presence of sinter and other high-level alteration features indicate that the uppermost parts of the mineralizing system are partially preserved.

Gold mineralization on the Properties is associated with regional mid-Miocene bimodal volcanism and rifting within the northern Basin and Range Province. The Properties are situated near a major lithospheric domain boundary that marks the western margin of the North American craton to the east and accreted oceanic terranes to the west. Pre-Cenozoic basement rocks are entirely concealed by a thick sequence of mid-Tertiary and younger volcanic and sedimentary rocks.

The geology of the Katey Property is characterized by Miocene ash flow tuffs, tuffaceous and clastic sediments, and rhyolitic volcanics. The highest gold values occur in two separate areas of the property, referred respectively as the West and East Zones. The West Zone is characterized by hydrothermal veins and vent breccias crosscutting both clastic and tuffaceous sediments and ash flow tuffs. Mineralization in the East Zone is associated with chalcedonic stockwork veins and breccias that crosscut rhyolitic intrusions. Surface channel samples outlined mineralization in both zones where historical gold values averaged 0.02 - 0.03 opt, over 30 m. Additional areas of significant alteration at Katey includes zone of silicification and silica-pyrite veining in sediments and rhyolite intrusions (South Zone); and a broad zone of chalcedonic veining and argillic alteration within ash flow tuff (West Canyon Zone).

Rock chip sampling by Headwater geologists confirmed gold mineralization in hydrothermal vent breccias on the Mahogany Property, and in chalcedonic stockwork veins and breccias on the Katey Property. Headwater geologists have also followed alteration along strike of a major high-angle fault at Mahogany, referred to as the Main Ridge Fault, and encountered gold mineralization in silicified



and brecciated tuffaceous sandstone (rock samples: RX512448 with 23 ppm Au, RX984619 with 25.1 ppm Au, and RX984620 Float with 55.2 ppm Au).

Headwater Gold Inc. undertook an exploration program on the Katey and Mahogany Properties from September 5, 2019 to October 18, 2020, consisting of soil sampling, stream sediment sampling, rock sampling, 1:5,000 scale bedrock and alteration mapping, and drone-based magnetic surveys. The program resulted in the collection of 721 soil samples, 24 stream sediment samples, 129 rock samples and 448 line-kilometres of drone magnetics (of which, 172.8 line-kilometres are on the Properties).

Preliminary interpretation of the drone magnetic survey at Mahogany has highlighted strong horizontal gradients across the southern extension of the Main Ridge Fault, and a broad magnetic low across the area of most intense argillic alteration and silicification (Wright, 2020a). Numerous magnetic lows peripheral to the Main Ridge Fault at Mahogany represents potential drill targets under thin alluvial cover.

Drone magnetics from the Katey Property shows two strongly contrasting magnetic domains separated by north-northwest-striking structures that underlie the East Zone target area, consistent with the interpretation that Katey lies at the margin of a Miocene caldera. The western half of the property is covered by a non-magnetic domain, consisting of intra-caldera tuffs and tuffaceous sediments. The eastern domain is characterized by strong magnetic response from flat-lying lavas that lie outboard of the interpreted caldera margin.

For continuing evaluation of the Properties, Headwater Gold Inc. should test the presence of bonanza-type vein targets at depths of 300 m down-dip of mineralized faults identified by mapping and sampling programs completed in the fall of 2020. A drilling exploration program is warranted on the Properties. The program would consist of 3,000 metres of drilling on each of the Mahogany and Katey Properties. Phase one is expected to cost \$2,262,000 USD.



# 2 INTRODUCTION

This report was commissioned by Headwater Gold Inc. and prepared by Derrick Strickland, P. Geo. The author, an independent professional geoscientist, undertook a review of available data, and was asked to recommend, if warranted, specific areas for further work on the Katey ("Katey") and Mahogany ("Mahogany") Properties. This technical report was prepared to support a non-offering prospectus on the Canadian Securities Exchange (the "CSE") and summarize the geological features of the Katey and Mahogany Properties.

The author was retained to complete this report in accordance with National Instrument 43-101 of the Canadian Securities Administrators ("NI 43-101") and the Form 43-101F1. The author is a "qualified person" within the meaning of National Instrument 43-101. This report is intended to be filed with the securities commissions in all the provinces of Canada except for Quebec.

In the preparation of this report the author utilized information provided by the Company as well as technical reports that have been previously published on www.sedar.com. Results for the historical exploration on the Properties are discussed in detail in Section 6 of this report. A list of reports, maps, and other information examined by the author is provided in Section 27 of this report.

Publicly available geological data for historical exploration work is generally non-existent in the United States. Compiling historical exploration results on a property commonly entails purchasing historical information from individuals or companies who have previously worked in the regions. This information is often incomplete and often lacks disclosure meeting current requirements. However, when the historical data is located it often acts a source of guidance for future exploration efforts. Headwater Gold Inc. purchased such a data set for the Katey and Mahogany Properties. Much of the historical exploration understanding in this report is derived from the purchased historical data.

The author reserves the right but will not be obliged to revise the report and conclusions if additional information becomes known subsequent to the date of this report. The information, opinions, and conclusions contained herein are based on:

- Information available to the author at the time of preparation of this report; and
- Assumptions, conditions, and qualifications as set forth in this report

The author visited the Mahogany Property on October 16, 2020 and the Katey Property on October 17, 2020. During this visit the author reviewed the geological setting and collected seven rock samples. Unless otherwise stated, all maps in this report were created by the author. The property geology section of this report comes directly from Headwater staff.

As of the date of this report, the author is not aware of any material fact or material change with respect to the subject matter of this technical report that is not presented herein, or which the omission to disclose could make this report misleading.



# 2.1 UNITS AND MEASUREMENTS

Table 1: Definitions,	Abbreviations,	and C	Conversions
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Abbreviation	Meaning		Abbreviation	Meaning
	Feet = 30.48 cm		kg	kilogram(s)
"	Inch =2.54 cm		km	kilometer(s)
%	Percentage		m	meter(s)
%	percent(age)		Ma	million years
USD	United States Dollars		masl.	Meters Above Sea Level
<	dreater than		mg mile	milligram(s) 5 280 ft= 1609344 km
0	degree(s)		QC	quality control
C	degrees Celsius		NI 43-101	Canadian National Instrument 43-101
1gram	0.3215 troy oz	_	mm	millimeter(s)
1troyoz	31.104 gm		Mudstone	and silt
Anomaly	An area highlighted by a geochemical or geophysical survey as possessing greater than background metal values or physical characteristics		n.a.	not available/applicable
asl	above sea level		M ineralizatio n	The process or processes by which mineral or minerals are introduced into a rock, resulting in a valuable or potentially valuable deposit
Au	Gold		Outcrop	An exposure of bedrock at the surface
Basin	Solid Rock underlying surficial		Ag	The period of geological time between about 251and
Bedrock	deposits		Permian	298 million years ago
Cenozoic	The era of geological time from the present to about 65 million years ago		opt	Troyounce perton
Chalcopyrite	A sulphide mineral of copper and iron; the most important ore mineral of copper.		ppb	parts per billion
Chip sample	A method of sampling a rock exposure whereby a regular series of small chips of rock is broken off along a line across the face, back or wall.		ppm	Parts per million (same as grams per tonne)
cm	centimeter(s)		Proterozoic	The eon of geological time between about 545 and 2,500 million years ago
Conglomerate	A very coarse-grained sedimentary rock containing rounded to subangular pebbles, cobbles, and / or boulders set in a finer grained matrix		QA	quality assurance
DDH	diamond drill hole		Mineral	definite physical properties and chemical composition and, if formed under favorable conditions, a definite crystal form.
Disseminated	A rock texture comprised of randomly scattered minerals (usually crystalline) throughout the rock mass		Quartz	A mineral composed of silicon dioxide
			Sandstone	A sedimentary rock composed primarily of sand sized grains
EM	Electromagnetic Geophysical		Sediment	A particulate matter that has been transported by fluid
Epithermal	Hydrothermal mineral deposit formed within one kilometre of the earth's surface, in the temperature		Shale	A fine-grained detrital sedimentary rock formed from clay and silt
Epithermal deposit	A mineral deposit consisting of veins and replacement bodies, usually in volcanic or sedimentary rocks, containing precious metals or, more rarely, base metals.		Siltstone	A fine-grained detrital sedimentary rock formed predominantly of silt
Exploration	Prospecting, sampling, mapping, diamond drilling and other work involved in searching for ore.		Stratigraphy	Composition, sequence and correlation of stratified rock in the earth's crust
Fault	A fracture in rock along which there has been relative displacement		Sulphides	A group of minerals which contains sulphur and other metallic elements such as copper and zinc. Gold is usually associated with sulphide enrichment in mineral deposits.
Fe	Iron		Supergroup	A formally named assemblage of related sedimentary aroups
Feldspars	A group of rock-forming tectosilicate minerals, (KAISi3O8 - NaAISi3O8 - CaAI2Si2O8)		т	ton (2000 pounds or 977.2 kg)
Float	loose pieces rock on the surface		t	tonne (1000 kg or 2,204.6 pounds)
g or gm	gram(s)		VLF-EM	Very Low Frequency Electro Magnetic Geophysical
a/t	grams per metric tonne	-	Zn	Zinc
Galana	Lead sulphide, the most common		GPS	Global Positioning System
Jaiena	ore mineral of lead	_	0.0	Sissari ostioning Oystem
IP	survey		ha	hectare(s)

Currency in United States dollars (US\$), unless otherwise specified (e.g., Canadian dollars, CDN\$)



# **3 RELIANCE ON OTHER EXPERTS**

For the purpose of the report, the author has reviewed and relied on ownership information provided on October 9, 2020 by Gregory Dering, Geologist for Headwater Gold Inc., which the author has no reason to question.

# **4 PROPERTY DESCRIPTION AND LOCATION**

The Katey and Mahogany Properties are located in Malheur County, Oregon, United States and are composed of 224 unpatented lode claims totaling 4,551 acres in two separate blocks that are 30 km apart from each other (see Table 2. Figure 1, Figure 2, and Figure 3).

The Mahogany Property comprises 139 unpatented lode claims that total 2,795 acres centered at 43.26° Latitude and -117.04° Longitude (Figure 2).

The Mahogany Property is a combination of land that is managed by the US Bureau of Land Management and private land. Internal to the Mahogany Property are two unpatented mineral claims (denoted in green) that Headwater does not retain the mineral rights (Figure 2). These two inlier claims, named Palisade and Windy Ridge #1, are owned by Jimmie Witt and Steven Schultz, respectively.

In the southwestern portion of the Mahogany Property, the mineral rights are severed from private surface rights (Figure 2). Headwater retains the right to explore and exploit mineral resources on these lands in accordance with the United States Stock Raising Homestead Act. In general Headwater would consult the local landowner for access; however, this is not required if work is done under a BLM Plan of Operations.

The Katey Property is composed of 85 unpatented lode claims totaling approximately 1,756 acres centered at 43.42° Latitude and -117.16° Longitude (Figure 3). The Katey Property lies on land managed by the US Bureau of Land Management.

All claims are registered to CP Holdings Corporation. An email from Gregory Dering, the Senior Geologist for Headwater Gold Inc., on November 9, 2020, confirmed that CP Holdings Corporation is a United States subsidiary of Headwater Gold Inc.

# 4.1 Mineral Rights Overview of Mining Law

The mining laws in Oregon permit any prospector and miner to make reasonable use of a mining claim as long as the use is incident and necessary to prospecting, mining and processing operations. A mining claimant has a right to use his claim for mining purposes only. The purpose of the claim is to protect the miner's discovery. The public may use the surface of a mining claim for any purpose allowed on other public lands other than mining. The public may not interfere with valid mining activities.



Under Oregon State Law, a Location Notice must be filed for record in the county in which the claim is located within 60 days after the date of location. Requirements for 'monumenting' any claim on the ground is found under state law. Within 60 days of the date of location, a copy of the Location Notice that was recorded with the county, and a map of sufficient scale to identify the claims on the ground shall be recorded at the BLM State Office within 90 days.

The following information is required on the Location Notice: name of claim/site, name and current mailing address of locator(s), type of claim or site, date of location, and legal land description. If one person is designated as agent, it is also necessary to include copies of the notarized designation of agent forms.

For new lode claims or mill or tunnel sites a \$225 per claim/site fee must be paid at the time of recording with the BLM. This fee covers a \$20 processing fee, a \$40 location fee, and a \$165 maintenance fee for the assessment year in which the claim/site was located. The assessment year begins on September 1. Lode claims are subject to annual US Bureau of Land Management fees of \$165 per claim per year. Headwater reports the lode annual claim fees are paid through September 1, 2021 for the Properties.

If conducting exploration and/or mining operations on Public Lands, the company will need to contact the local BLM office beforehand. Depending on the type and size of the proposed activity, the company will most likely have to file either a notice, or a plan of operations with the local BLM office, including submittal of a financial guarantee or bond to assure that reclamation will be completed. Reclamation of any disturbed area is required. Casual use activities such as staking mining claims and surface sampling, do not require a notice or plan unless there will be significant surface disturbing activity.







# Figure 2: Mahogany Lode Claims

1	K / / / / Kalichatak	495000	181810	496000	07 1 26	497000	498000	0
92000	Survey		MH-20	MH-22 MH-24	MH-28 MH-30 MH-32	MH-34 MH-36	WEB2	37
479		AT AN	MH-61 MH-63	MH-67 MH-69	MH-74 MH-73 MH-73 MH-73 MH-73	MH-77 MH-79 MH-81		
1000	Partie Conden	Crist	MH-62 MH-64	MH-66 MH-68 MH-70	MH-72 MH-74 MH-76	MH-78 MINO	Att A	SI
479		MH-103	MH-107	MH-111 - MH-113	MH-115 MH-117 MH-119	MH-121 MH-123 MH-125	MH-127	A CA
	Contraction of the second	MH-104	MH-106 MH-108	MH-112 MH-112	MH-116 MH-118 MH-120	MH-122 MH-124 MH+126	WH-128	No.
479000		HH147	MH-149 MH-151	MH-153 MH-157	MH-159 MH-161 MH-163	MH-165 MH-167 MH-169	MH-171	3
		MH-148	MH-150 MH-152	MH-156 MH-156 MH-158	MH-160 MH-162 MH-164	MH-166 MH-168 MH-170	MH-172	X
4789000		+ 771-HM MH-179	MH-181 MH-183	MH-185 MH- <u>18</u> 7 MH-189	MH-191 MH-193 MH-195	MH-197 MH-199 MH-201	MH-203	1253
1	4557	MH-178 MH-180	MH-182 MH-184	MH-186 MH-188 MH-190	MH-192 MH-194 MH-196	MH-198 MH-200 MH-202	195 107 107 107 107 107 107 107 107 107 107	14
4788000	The second secon	MH-	228 H	MH-210 MH-211 MH-212	MH-213 MH-214 MH-215	MH-216 MH-49 MH-51		-4300
		MH	230 L12-HW	MH-215 MH-221	MH-223 MH-225 MH-226	DS-HW		4070
7000	45	*080*	MH-218	MH-220 F MH-222	MH-224		HEUR CO	4500
478	5.200		MH-231	MH-232	0	DEEP 0.5	Kilometers 1	23
	Claim Map	Headwater ( Mahogany F	<b>Gold Inc.</b> Property	Date: No Datum: N/ Scale: 1:2	ovember 18, 2020 AD 1983 UTM Zone 24,000	11N	Lode Claims Other Lode Claims Private Land	N

# Figure 3: Katey Lode Claims



HEADWATER GOLD INC



# Table 2: Katey and Mahogany Properties Lode Claims

Project	Claim_ID	Project	Claim_ID	Project	Claim_ID	Project	Claim_ID	Project	Claim_ID
Katey	KT-67	Katey	KT-49	Mahogany	MH-22	Mahogany	MH-117	Mahogany	MH-148
Katey	KT-69	Katey	KT-51	Mahogany	MH-24	Mahogany	MH-119	Mahogany	MH-150
Katey	KT-71	Katey	KT-53	Mahogany	MH-26	Mahogany	MH-121	Mahogany	MH-152
Katey	KT-73	Katey	KT-55	Mahogany	MH-28	Mahogany	MH-123	Mahogany	MH-185
Katey	KT-68	Katey	KT-57	Mahogany	MH-30	Mahogany	MH-125	Mahogany	MH-187
Katey	KT-70	Katey	KT-59	Mahogany	MH-32	Mahogany	MH-127	Mahogany	MH-189
Katey	KT-72	Katey	KT-61	Mahogany	MH-34	Mahogany	MH-103	Mahogany	MH-191
Katey	KT-74	Katey	KT-63	Mahogany	MH-36	Mahogany	MH-105	Mahogany	MH-193
Katey	KT-109	Katey	KT-66	Mahogany	MH-227	Mahogany	MH-107	Mahogany	MH-195
Katey	KT-111	Katey	KT-76	Mahogany	MH-228	Mahogany	MH-110	Mahogany	MH-197
Katey	KT-113	Katey	KT-46	Mahogany	MH-229	Mahogany	MH-112	Mahogany	MH-199
Katey	KT-115	Katey	KT-48	Mahogany	MH-230	Mahogany	MH-114	Mahogany	MH-201
Katey	KT-117	Katey	KT-50	Mahogany	MH-20	Mahogany	MH-116	Mahogany	MH-203
Katey	KT-119	Katey	KT-52	Mahogany	MH-65	Mahogany	MH-118	Mahogany	MH-179
Katey	KT-101	Katey	KT-54	Mahogany	MH-67	Mahogany	MH-120	Mahogany	MH-181
Katey	KT-103	Katey	KT-56	Mahogany	MH-69	Mahogany	MH-122	Mahogany	MH-183
Katey	KT-105	Katey	KT-58	Mahogany	MH-71	Mahogany	MH-124	Mahogany	MH-186
Katey	KT-107	Katey	KT-60	Mahogany	MH-73	Mahogany	MH-126	Mahogany	MH-188
Katey	KT-110	Katey	KT-62	Mahogany	MH-75	Mahogany	MH-128	Mahogany	MH-190
Katey	KT-112	Katey	KT-64	Mahogany	MH-77	Mahogany	MH-104	Mahogany	MH-192
Katey	KT-114	Katey	KT-121	Mahogany	MH-79	Mahogany	MH-106	Mahogany	MH-194
Katey	KT-116	Katey	KT-89	Mahogany	MH-81	Mahogany	MH-108	Mahogany	MH-196
Katey	KT-118	Katey	KT-91	Mahogany	MH-215	Mahogany	MH-153	Mahogany	MH-198
Katey	KT-120	Katey	KT-93	Mahogany	MH-216	Mahogany	MH-155	Mahogany	MH-200
Katey	KT-102	Katey	KT-95	Mahogany	MH-49	Mahogany	MH-157	Mahogany	MH-202
Katey	KT-104	Katey	KT-97	Mahogany	MH-51	Mahogany	MH-159	Mahogany	MH-204
Katey	KT-106	Katey	KT-99	Mahogany	MH-61	Mahogany	MH-161	Mahogany	MH-180
Katey	KT-108	Katey	KT-122	Mahogany	MH-63	Mahogany	MH-163	Mahogany	MH-182
Katey	KT-2	Katey	KT-94	Mahogany	MH-66	Mahogany	MH-165	Mahogany	MH-184
Katey	KT-4	Katey	KT-96	Mahogany	MH-68	Mahogany	MH-167	Mahogany	MH-211
Katey	KT-6	Katey	KT-98	Mahogany	MH-70	Mahogany	MH-169	Mahogany	MH-212
Katey	KT-8	Katey	KT-100	Mahogany	MH-72	Mahogany	MH-171	Mahogany	MH-213
Katey	KT-10	Katey	KT-153	Mahogany	MH-74	Mahogany	MH-147	Mahogany	MH-214
Katey	KT-12	Katey	KT-155	Mahogany	MH-76	Mahogany	MH-149	Mahogany	MH-209
Katey	KT-14	Katey	KT-157	Mahogany	MH-78	Mahogany	MH-151	Mahogany	MH-210
Katey	KT-65	Katey	KT-159	Mahogany	MH-80	Mahogany	MH-154	Mahogany	MH-177
Katey	KT-45	Katey	KT-161	Mahogany	MH-82	Mahogany	MH-156	Mahogany	MH-178
Katey	KT-47	Katey	KT-163	Mahogany	MH-84	Mahogany	MH-158	Mahogany	MH-217
		Katey	KT-165	Mahogany	MH-225	Mahogany	MH-160	Mahogany	MH-219
		Katey	KT-141	Mahogany	MH-226	Mahogany	MH-162	Mahogany	MH-221
		Katey	KT-143	Mahogany	MH-50	Mahogany	MH-164	Mahogany	MH-223
		Katey	KT-145	Mahogany	MH-62	Mahogany	MH-166	Mahogany	MH-218
		Katey	KT-147	Mahogany	MH-64	Mahogany	MH-168	Mahogany	MH-220
		Katey	KT-149	Mahogany	MH-109	Mahogany	MH-170	Mahogany	MH-222
		Katey	KT-151	Mahogany	MH-111	Mahogany	MH-172	Mahogany	MH-224
		Katey	KT-43	Mahogany	MH-113			Mahogany	MH-231
		Katey	KT-44	Mahogany	MH-115			Mahogany	MH-232



An Exploration Permit is required by the state of Oregon for all activities that disturb more than one surface acre or involve drilling to greater than 50 feet for the purpose of determining presence, location, extent, grade or economic viability of mineralization.

The state of Oregon's Department of Geology and Mineral Industries (DOGAMI) currently recommends that applicants contact the department at least 180 days prior to initiation of activities. Other state, federal, tribal, and local agencies may require the applicant to obtain approval prior to operation. If an application is incomplete, the department shall notify the applicant in writing within 30 days of receipt and specify the deficiencies; the applicant may resubmit the application with deficiencies corrected within 60 days for review.

Minimum requirements for an Exploration Permit include:

- Completed Exploration Permit Application Form
- Non-refundable Application Fee
- Project Description and Reclamation Plan (see Reclamation Guidelines for Exploration Projects)
- Permit Area Map with Proposed Boundary and Activity Locations
- Proposed Reclamation Security Amount (see Exploration Bond Calculation Worksheet)

DOGAMI coordinates with other agencies to avoid duplication on the part of applicants. The department will notify local planning authorities and other appropriate public agencies that it has received the application for review. Based on external timelines, coordination with other agencies generally takes more than 30 days after receipt of a complete application for an Exploration Permit to be approved or denied by the department. The department may attach conditions to the DOGAMI permit to reflect concerns which are not adequately addressed. It is the applicant's responsibility to obtain any necessary permits from other agencies.

Exploration Permits must be renewed and reported upon annually until all activities and reclamation are complete.



# 5 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE AND PHYSIOGRAPHY

The Katey and Mahogany Properties are located in southeastern Oregon approximately 70 km southwest from Nampa, Idaho via federal Highway 95. Mahogany is accessed directly from Highway 95. Katey is accessed from Highway 95 by driving 24 km north on Succor Creek Road and then turning left and driving for 3 km along McIntyre Springs Rd.

Winter and wet weather conditions occasionally limit access to the Properties, although on-site travel is generally possible year-round. The project areas are located in the Owyhee region of eastern Oregon. Terrain at the project areas is mainly open steppe with mesas, broad valleys, and gently rolling hills to steeper uplands. Elevations range from 1,000 to 1,300 metres above mean sea level. Vegetation consists of sagebrush, weeds, and desert grasses tolerant of semi-arid conditions. The surface rights as described in Section 4 are sufficient for the mining and exploration activities proposed. It is expected that seasonal road maintenance will be sufficient to provide access to the site for all personnel and access to the Properties. Exploration activities can be conducted year-round.

The climate can be described as the semi-arid, continental interior type, with average annual precipitation of about 25 cm, roughly half of which falls as snow between November and March. Local weather data indicate a mean annual temperature of 11°C, with daily temperatures ranging from an extreme low of -28°C, in the winter to extreme highs of 38°C and higher in the summer.

Logistical support is available in the towns of Marsing, Idaho, Nampa, Idaho, and Ontario, Oregon, all of which are located within 80 km of the project site. Mining personnel, equipment, fuel, supplies, and engineering and telecommunications services for operations for Katey and Mahogany Properties are expected to be available from Malheur County, Oregon and the adjacent greater Boise area in neighboring southern Idaho.



# 6 HISTORY

The information in this section has mainly been extracted and modified from unpublished reports and correspondence of Manville Exploration ("Manville"), a private Oregon-based mineral exploration company, which was provided to the author by Headwater. The Katey and Mahogany Properties were discovered, staked, and first explored in the 1980s by Manville. Work by Manville included detailed mapping, rock chip sampling, and trenching. At Katey, Manville drilled 23 shallow (<180 m) rotary holes before optioning the property to ASARCO from 1988 to 1990, after which time no further work was done. Mahogany was leased by Manville from Chevron from 1986 to 1990, during which time eight shallow reverse circulation holes were drilled, totaling just 630 m.

# 6.1 Mahogany Historical Gold Exploration

### Manville Exploration 1985 - 1986

Gold mineralization at Mahogany was discovered in 1985 and the property staked by Manville in the fall of that year. In 1986 Manville trenched across silicified outcrops referred to in this report as *Rotary Ridge*, conducted geochemical traverses, and detailed mapping. The property was determined to contain abundant calcite-zeolite flooded sediments which, in part, halo a silica-rich hydrothermal vent breccia. Surface channel sampling by Manville found 0.06 oz. Au/ton over a 19.8 m section across Rotary Ridge. Based on Manville's results, the property was leased to Chevron in December of 1986.

### Chevron 1987 - 1990

In 1987 Chevron conducted reconnaissance mapping, rock chip sampling, a resistivity survey, and two (2) geophysical lines, all centered on Rotary Ridge and an adjacent alteration area of outcropping silicified breccia. The only drilling at Mahogany consisted of eight shallow reverse circulation holes completed by Chevron in 1988 and 1989, totalling approximately 633 m. The locations of historical drill holes and summaries of significant intercepts are given in Section 10. Headwater has obtained short summary reports for two geophysical surveys conducted at Mahogany, but does not possess the historical survey data. In 1990 a 2.8 line-km VLF-EM survey was conducted by Manville geologist Joe LeVay, that indicated a conductor and a probable shallow silicified zone. Additionally, a small resistivity survey contracted by Chevron consisted of 6 soundings using a Schlumberger array along a single 800 m-long fence that traversed Rotary Ridge and adjacent areas of intense silicification. The western-most sounding point was atop the trace of the Main Ridge Fault. However, the survey did not span the Main Ridge Fault. A summary report suggests the results were inconclusive.

Chevron also collected 66 rock samples, with two samples giving, 0.142 ppm Au, and 0.173 ppm Au.



# 6.2 Katey Historical Gold Exploration

# Manville Exploration 1986 - 1989

The Katey gold prospect was first identified and subsequently staked by Manville geologists in 1987. Manville conducted an initial sampling campaign consisting of 80 rock samples, with results ranging from below detection limit up to 2,750 ppb Au. The exact locations of all historic rock samples from the Katey Property are not known. Manville conducted an exploration program in 1988 that consisted of a pilot soil sampling program over the East Zone, detailed 1:1000 scale geological mapping and core drilling. The Manville drill campaign consisted of 23 core holes, and intersected gold mineralization in the West Zone and East Zone.

In 1988-1989 thirty-four rock sample were collected. The two highest grade samples from this program contained 13,400 ppb Au (sample RMR-81) and 19,600 ppb Au (sample RMR 150), respectively. These samples appear to have been collected right beside each other.

Geophysical data collected by Manville included a resistivity survey in 1988 over the East, West, and South Zones. Experimental VLF-EM surveys were conducted in the vicinity of the West and West Canyon Zones in 1990 (Ellingwood, S.G., 1988). Headwater has obtained summary reports which describes the work but does not possess the geophysical data.

# ASARCO 1989 - 1990

ASARCO leased the Katey property from Manville in 1989. ASARCO collected 326 soil samples over the East, West, and West Canyon Zones and conducted two campaigns of reverse circulation drilling. The first round of drilling was conducted in 1989 and consisted of six holes, totalling 752.9 m (2,470 ft) to a maximum depth of 134.1 m (440 ft). ASARCO followed up with an additional 9 reverse circulation holes were completed holes in 1990, totalling 1,293.9 m (4,245 ft) to a maximum depth of 152.4 m (500 ft). The best intercept was in hole KTR-89-5 and assayed 0.02 opt Au over 36.57 m. Collar locations and further drilling data are presented in Section 10.

# 7 GEOLOGICAL SETTING AND MINERALIZATION

# 7.1 Regional Geologic Setting

Rhyolite flows and ash-flow tuffs (16.1–14.0 Ma) erupted from northeastern Oregon to northern Nevada (McDermitt volcanic field) shortly after the flood basalt was emplaced. Subsidence of the Oregon-Idaho graben (15.5–15.3 Ma) coincides with eruption of rhyolite flows and caldera-related ash flow tuffs from vents along the margins and within the graben. Mafic and silicic intra-graben volcanism accompanied sedimentation from about 15.3 to 10.5 Ma. Sedimentary and volcanic rocks from extra basinal sources, especially from those occurring in southwestern Idaho, were introduced periodically (Cummings et al., 2000).

Gold mineralization at Katey and Mahogany is related to mid-Miocene bimodal volcanism and rifting in the Owyhee region of the northern Basin and Range Province. The onset of rift-related volcanism in the Owyhee region was broadly coeval the inception of Yellowstone hot spot-related



volcanism near McDermitt, NV. Regional volcanism that began near McDermitt at ca. 16.6 Ma and continued until ca. 15.3 Ma was focused in a northerly-trending corridor of extensional faults, referred to as the Oregon-Idaho Graben (Cummings et al., 2000). The early stages of mid-Miocene volcanism were characterized by voluminous eruptions of tholeiitic basalts, including the Steens, and Columbia River Groups, and emplacement of mafic dike swarms (Ekren et al 1981). At approximately 15.5 Ma, mafic volcanism in the Owyhee region gave way to peralkaline felsic volcanism which included the formation of the Three Fingers Caldera and was the likely driving process for gold mineralization at Katey. The change from dominantly mafic to felsic volcanism is marked by the eruption of numerous calderas and rhyolite flow-dome fields that define the Lake Owyhee Volcanic Field in eastern Oregon. Felsic volcanism was accompanied by regional subsidence and formation of the Oregon-Idaho graben from ca. 15.4 Ma to ca. 10 Ma. Miocene graben fill is dominated by epiclastic lacustrine deposits, fluvial sediments shed westward from beyond the graben margin, pyroclastic deposits, intracaldera tuffs, and locally erupted lava fields.

The transition from dominantly mafic to felsic volcanism and the development of extensional fault systems in the Owyhee region marked the onset of widespread hydrothermal activity spanning several million years and leading to the formation of gold deposits at DeLamar and Grassy Mountain as well as at Katey and Mahogany. At Mahogany in particular, syn-sedimentary hot-spring alteration and precious-metals mineralization of graben fill were controlled by the same intra-graben fault zones that served as magmatic conduits. (Headwater 2021 Communications)



# Figure 4: Oregon-Idaho graben



Regional map showing the Oregon-Idaho graben (OIG) in context of the dike swarms of the Columbia River Basalt Group (CRBG dikes), the northern Nevada rift (NNR), and the western Snake River plain (WSRP). Regional features in the vicinity of the Oregon Idaho graben depicted by additional symbols as follows: BG—Baker graben; C—Crowley; CR—Castle Rock; DM—Dooley Mountain; GP—Graveyard Point, HB— Harney basin; HJ— Huntington Junction; HM—Hart Mountain; LOVF—Lake Owyhee volcanic field; MVF— McDermitt volcanic field; PM—Pueblo Mountains; SM—Steens Mountain; SCR—Silver City Range; SRP— Snake River plain; WB—Westfall Butte; WR—Warner Range; UR—Unity Reservoir; Y—Yellowstone Plateau. WA—Washington; OR—Oregon; ID—Idaho; MT—Montana; WY—Wyoming; UT—Utah; NV— Nevada; CA—California. Numbers displayed along the Snake River plain (SRP) show the age progression of rhyolitic volcanism. (Modified after Cummings et al., 2000).



# 7.2 Mahogany Property Geology

Mahogany is a structurally-controlled hot-spring-type gold prospect that shows evidence of nearsurface hydrothermal activity. The only geochronology reported from Mahogany is a K-Ar age from adularia that yielded an age of  $12.6 \pm 0.6$  Ma (Rytuba et al., 1990).

Rocks in the Mahogany Project area are of Miocene age and consist of three distinct packages. From oldest to youngest these are: 1) Older tholeiitic basalt flows, 2) Mafic-intermediate volcanic rocks, and 3) Felsic tuff and epiclastic sediments. Also present are basaltic dikes and flows that occur throughout the two younger packages.

### **Older Tholeiitic Basalts**

Sparsely exposed on private property along Succor Creek southwest and nowhere exposed on the property, this unit has not been examined in the field by Headwater geologists. Described as aphyric or olivine-phyric tholeiitic basalt with relatively high-Fe and low Na2O, that contrasts with other basalts in the area (Ferns and Gilbert, 1992). This unit is considered by Headwater geologists to be broadly equivalent to the Lower Basalt flows encountered at the DeLamar Mine (Bonnichsen, 1983), which were erupted from 16.5-16.7 Ma (Hasten, 2012). These older tholeiitic basalt flows are thought to underlie the entire Mahogany project area and potentially represent a favorable vein host.

#### Intermediate Volcanic Rocks

The Property is dominated by andesitic vent-facies pyroclastic and volcaniclastic deposits, as well as andesite flows and subvolcanic intrusions. Deposits were generated by a series of hydrovolcanic eruptions, probably from maars and tuff rings. Proximal facies tuffs include thin bedded, clast supported lapilli tuffs while vent facies tuffs include massive matrix-supported breccias (Ferns and Gilbert, 1992). Units of this package are best exposed in Succor Creek Canyon and exhibit abrupt changes in thickness that are interpreted as the result of eruption from local vents. The unit is preserved in the footwall of the Main Ridge Fault and extensively altered north of the silicified vent breccias.

### Felsic Tuff and Epiclastic Sediments

The most widespread package of rocks exposed at the Mahogany Property, consists of interbedded fine grained felsic tuff, epiclastic siltstones and sandstones, and coarse-grained fluvial deposits shed westward from the Owyhee highlands to a basin of the Oregon-Idaho Graben. At Mahogany, this package has been divided into 6 units by Headwater geologists mapping at 1:5,000 scale (Figure 5). Notably glass-rich, fine grained tuffs occur throughout the package (Tmrt, Tbt, Twr) and have been distinguished on the basis of stratigraphic position with respect to interlayered marker units. Similarly, fine tuffaceous sediments that make up Tst1, Tst2, and Twst have, so far, been distinguished on the basis of stratigraphic position and not distinct lithology.



#### **Main Ridge Fault**

Gold mineralization at Mahogany is hosted in a major property-scale normal fault, referred to as the Main Ridge Fault. The Main Ridge Fault strikes N10E and dips 80° - 85° east and appears to be part of a diffuse network of normal faults at the northeastern margin of the Oregon-Idaho Graben (Cummings et al., 2000). Maximum displacement along the fault is on the order of 100 m, but poorly constrained due to uncertainties in the thicknesses of the Succor Creek Formation subunits preserved in the hanging wall. Where exposed, the trace of the Main Ridge Fault is marked by silicified breccia with open space between clasts that locally contains a matrix of white zeolite (Figure 21).

#### **Breccia Hill**

Two knobs consisting of intensely silicified pinkish red limonitic breccia hold up the north-easterlytrending ridge referred to as Breccia Hill (Figure 5). The breccia contains angular clasts of tuff and epiclastic sediments derived from the local formations as well as cm-scale angular fragments of pale pink sinter and fossilized reeds (Gilbert, 1988). These outcrops are interpreted to be the partially eroded remnants of pipe-shaped hydrothermal breccia bodies that may extend close to the paleosurface, incorporating subaerial debris. Within the breccia are cm-scale oval-shaped voids with banded silica coatings. Framboidal pyrite is reportedly present in less oxidized breccia material. Surrounding the breccia bodies is a zone of strong potassic alteration that occurs as an apron of low-weathering pale yellow to white clay underlain by weakly silicified sandstones and pebble conglomerate. The potassic alteration assemblage is made up of illite, adularia, and quartz.

#### **Rotary Ridge**

Rotary Ridge comprises a gently-tilted package of strongly silicified tuffaceous siltstones preserved in the hanging wall of the Main Ridge Fault that extends approximately 200 m from the fault trace toward Breccia Hill. Silicified outcrops along Rotary Ridge host quartz-calcite-zeolite veins up to 10 cm wide and breccia zones containing fine grained white quartz-calcite matrix. Rotary Ridge was the focus of initial surface exploration, including trenching by Manville that yielded 0.05 opt Au over 19.8 m and 0.20 opt Au over 3.04 m in a second trench (Ferns, 1997). Quartz-adularia-pyrite veins and quartz-calcite-zeolite veins and stockworks are reported from this area (Gilbert, 1988).



### Figure 5: Mahogany, Headwater Mapped Geology





# 7.3 Katey Property Geology

The Katey gold prospect is hosted in middle Miocene volcanic and sedimentary rocks of the Three Fingers Caldera, located in the Lake Owyhee Volcanic Field (Rytuba et al., 1991). Fracture zones developed at the margin of the Three Fingers Caldera margin appear to be important controls on mineralization and the emplacement of rhyolitic plugs and domes. The stratigraphy of the property is characterized by intracaldera tuff, tuffaceous and clastic sediments, intercalated with basalt and rhyolite flows (Figure 6). Normal faults that were active during middle Miocene volcanism generally strike NNW and appear to have relatively steep dips. NNW-trending faults both cut and are overlapped by Miocene volcanic and sedimentary rocks. Following the initial eruption of the Three Fingers Caldera, volcanic and volcaniclastic sedimentary deposits filled basins formed during syn-magmatic extension and likely transtensional deformation. Intra-caldera rhyolite domes and flows were likely emplaced in grabens, where local fractures may have served as magmatic conduits. The best gold values occur in two separate areas of the property, referred to as the West Canyon and South Zones.

### West Zone

The West Zone is characterized by hydrothermal veins and vent breccias cross-cutting both clastic and tuffaceous sediments and ash flow tuffs. The surface expression of West Zone is a small plug of silicified arkose approximately 75 m in diameter. A mineralized shallow-dipping calcite breccia roughly parallel to the bedding cuts the upper portion of the exposure. A northwest-striking normal fault bisects the exposure of silicified arkose. A one to two-metre-wide silicified rubble breccia with clasts up to 50 cm in diameter fills the fault on the southwest side of the exposure. This is interpreted to be a fissure-like hot spring vent which was filled with surface debris.

Gypsum replaces sanidine phenocrysts within zones of silicification and kaolinite alteration and forms thin veinlets which extend up into the silicified arkose. The gypsum veinlets are restricted to highly fractured zones where the host tuff has been stained blood red by iron oxides. A zone of massive powdery gypsum is peripheral to the silicified arkose at the surface.

#### East Zone

The East Zone is hosted in pervasively altered rhyolite porphyry (Map unit *Trp*) in a structural corridor within a series of rhyolite domes that intruded the Three Fingers Caldera margin. Rhyolite porphyry in the East Zone contains chalcedonic and opaline stockwork veins and extensive brecciation which grades outwards into kaolinite +illite +chlorite alteration. Small amounts of cinnabar are present at shallow levels in the kaolinite zone. Surface channel samples by Manville outlined mineralization in the East Zone where historical gold values averaged 0.02 - 0.03 opt, up to or exceeding 30 m in length.



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# 7.4 Mineralization

# 7.4.1 Mahogany Property Mineralization

Hydrothermal alteration at Mahogany is characteristic of a low sulphidation hot spring -type epithermal system. There is pronounced lateral zonation from a high-temperature zone dominated by silica and illite to a propylitic halo (Figure 7). At the periphery of the system low temperature zeolite alteration is widespread, forming deposits large enough to sustain commercial guarry operations. A north-trending corridor of high temperature alteration extends 30 km along the Main Ridge Fault, suggesting this structure was the main control on hydrothermal fluid upflow. Gold mineralization at surface occurs mainly within a broad zone of intense guartz-illite alteration that encompasses the areas of historical exploration work referred to by Headwater as Rotary Ridge and Breccia Hill, as well as a 301 m long section of the Main Ridge Fault. Sinter occurs on the property at Breccia Hill both as displaced blocks up to 1 m and as clasts within the densely silicified phreatic bodies. The presence of sinter indicates that the epithermal system is preserved at a high level and the structural level at which bonanza-type vein mineralization is predicted to occur has yet to be tested at depth. Headwater has not yet carried out petrographic or hyperspectral analysis at Mahogany. The following description of alteration and mineralization is based on hand samples, mapping, and analyses reported in an unpublished M.S. thesis of Deborah Gilbert from 1988 on the Mahogany property.

Mineralized fault breccias containing up to 55 ppm Au were identified by Headwater geologists in pervasively silicified epiclastic sandstones and siltstones within tabular breccia zones up to 3.5 m wide along the trace of the Main Ridge Fault. The breccias consist of angular, blocky, cm-scale clasts and are mainly clast-supported. The breccia matrix consists of fine-grain silicified cataclasite and fine buff-white zeolite, identified by Gilbert (1988) as laumontite. Clast surfaces locally exhibit fine drusy quartz overgrowths. The outcrops are pale orange to tan with weak limonitic staining throughout, but otherwise show little evidence of sulphide mineralization. Extremely fine-grained adularia has been identified in thin section from fault breccias in this area by Gilbert (1988).

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#### Figure 7: Mahogany, Headwater Interpreted Alteration





# 7.4.2 Katey Property Mineralization

Gold mineralization within the Katey prospect is spatially related to small high-silica rhyolite domes. Hydrothermal activity was concurrent with the deposition of fluvial sediments within the caldera moat (Rytuba et al., 1990). Host rocks for the mineralization include the Spring Creek tuff, arkosic sandstones, and high silica rhyolites.

The highest historical Au concentration (7.1 ppm) was found in a sample of silicified high-silica rhyolite from the East Zone of mineralization. Gold was present in this sample as sub-micron sized electrum grains disseminated within the devitrified matrix of the rhyolite. Within the West Zone gold mineralization is restricted to the central silicified zone of alteration. Gold concentrations in this zone are typically between 0.1 and 0.2 ppm (Manville Corp. data).

Highest historical As and Sb concentrations (512 and 30 ppm, respectively) are found in samples containing quartz-pyrite veins. Highest historical Hg concentrations (8.138 ppm) are found in a smectite-altered plug of high-silica rhyolite located approximately 500 metres north of the East zone. Cinnabar is assumed to be the Hg-bearing mineral phase.

Significant features of mineralization in the Katey prospect include: (1) spatial relationship of gold mineralization to high-silica rhyolite domes; (2) high concentrations of Ag, Se, and Mo; and (3) abundance of gypsum in the West Zone of mineralization. The spatial distribution of sulfate and clay mineral alteration zones about around a central area of silicification in the West Zone is typical of many epithermal mineral deposits (Bonham, 1988). This pattern of alteration is indicative of zones where surficial steam-heated acid sulfate waters are mixing with rising boiling fluids (Hedenquist, 1986).

# 8 DEPOSIT TYPES

The Katey and Mahogany are a hot spring-type low sulphidation gold prospects. The historical work by Manville, ASARCO, and Chevron appears to have been of good quality. Previous workers were clearly focused on shallow, bulk tonnage targets. At both Properties the untested targets are structurally controlled zones at slightly greater depth which conventional models of low sulphidation epithermal deposits predict to be the main mineralization zone in such systems.

Rock chip geochemistry from both Mahogany and Katey are considered representative of lowgrade precious metal mineralization that occurs high in the hydrothermal system, near the paleosurface. Headwater intends to test "bonanza" targets predicted to occur at depths up to a few hundred metres below the paleosurface (Figure 8). Locating the principal fluid conduits is critical to this exploration concept. Therefore, Headwater's exploration work has prioritized identification of mineralized structures and alteration zonation.

Contemporary models of low sulphidation systems point to strong vertical zonation of alteration and metals, mainly related to strong gradients in temperature and pressure near the surface. At both Katey and Mahogany, alteration mineralogy and textures are characteristic of the highest levels of low sulphidation systems, such that the current level of exposure is as little as a few tens



of metres below the paleosurface. The alteration assemblage at both properties is characterized by chalcedony and silica flooding, and quartz-calcite veins. Further evidence of very high-level alteration at Mahogany includes blocks of possible subaerial sinter in the apron of eroded material around the hydrothermal breccia knobs. Lateral zonation of gangue minerals at Mahogany is also consistent with classic low sulphidation epithermal alteration zonation, including coarse bladed calcite veins, agate, and zeolites all outboard of the core target area.

#### Figure 8: Deposit Model



Schematic Model of a Low-Sulphidation Epithermal Mineralizing System (After Sillitoe and Hedenquist, 2003)



# 9 EXPLORATION

Headwater staked the core claim groups at Katey and Mahogany between September 1 and September 4, 2019 and immediately commenced exploration activity in September and October, 2019. This activity consisted of geological reconnaissance and rock chip sampling to confirm geochemical anomalies and gold mineralization in outcrops previously reported in academic theses (Gilbert, 1988; Zimmerman, 1991) and public reports. The preliminary rock sampling program by Headwater geologists confirmed gold mineralization in hydrothermal vent breccias at Mahogany and chalcedonic stockwork veins and breccia at Katey. Headwater geologists followed alteration along strike of the Main Ridge Fault at Mahogany and encountered gold mineralization in silicified and brecciated tuffaceous sandstone (rock samples RX512448 with 23 ppm Au, RX984619 with 25.1 ppm Au, and RX984620 float sample with 55.2 ppm Au).

Headwater Gold Inc. undertook a more extensive exploration program at the Katey and Mahogany Properties from June 28, 2020 to October 18, 2020 that consisted of soil sampling, stream sediment sampling, rock sampling, 1:5,000 scale bedrock and alteration mapping and drone magnetic surveys. The program resulted in the collection of 721 soil samples, 24 stream sediments, 129 rock samples and 448 line-kilometres of drone magnetics. Outcrop mapping of lithology and alteration for Katey was compiled at 1:5,000 scale in GIS and verified in the field by Headwater geologists. Interpreted geology (Figure 5) and alteration maps (Figure 7) of Mahogany claim block were generated based on 1:5000-scale outcrop mapping by Headwater geologists in the summer of 2020.

Figure 5 is the Mahogany the resultant map generated by Headwaters' 1:5000 mapping program. The Mahogany geology and mineralization in Section 7 of this report comes from the observations in the 2020 mapping program.

# 9.1 Rock and Soil Geochemical Sampling

The Mahogany soil survey yielded gold and arsenic anomalies across the Main Ridge Fault and hydrothermal vent breccias, in good agreement with rock chip geochemistry and stream sediments (See Figure 9 to Figure 12).

Soil sampling over the Katey target yielded gold, mercury, and arsenic anomalies in close agreement with historical soils data collected by ASARCO in 1989 (Figure 13 to Figure 15). Soil anomalies at Katey correlate with outcropping mineralization in the West and East Zones (see Figure 6 locations for the Zones but also reveal subtle pathfinder element anomalies in an area of alluvial cover that has never been drilled, centered on UTM coordinates 487,000E, 4,808,000N.



### Figure 9: Mahogany Property: Gold in Soils



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# Figure 10: Mahogany Property: Arsenic in Soils





# Figure 11: Mahogany Property: Mercury in Soils





#### Figure 12: Mahogany Property: Rock and Stream Sediments



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# Figure 13: Katey Property: Gold in Soils





# Figure 14: Katey Property: Arsenic in Soils





# Figure 15: Katey Property: Mercury in Soils





# 9.2 Geophysical Surveys

A drone magnetic survey was completed over the Katey and Mahogany Properties during September 9 - 13, 2020 by MWH Geo-surveys for a total of 448 line-kilometres, of which 172.48 line-kilometres are on the Katey and Mahogany Properties. The objectives of the surveying were to define structures, lithologies and alteration in support of the gold exploration program on the property. Data processing and interpretation were performed by Wright Geophysics.

Preliminary interpretation of the drone magnetics from Mahogany highlights strong horizontal gradient across the southern extension of the Main Ridge Fault and a broad magnetic low across the area of most intense argillic alteration and silicification (Wright, 2020a). Numerous magnetic lows peripheral to known mineralization along the Main Ridge Fault at Mahogany represent potential targets under thin cover.

At Katey, two strongly contrasting magnetic domains are separated by north-northwest-striking structures that underlie the East Zone alteration area and is consistent with the interpretation that Katey lies at the margin of a Miocene caldera. The western half of the property is characterized by non-magnetic intra-caldera tuffs and tuffaceous sediments. The eastern domain is characterized by strong magnetic response from flat-lying lavas that lie outside the interpreted caldera margin (Wright, 2020b).

# 9.2.1 Mahogany Airborne Magnetic Survey

Mahogany Property geophysical survey lines are oriented east-west and spaced at 100 m. A total of 280 line-km comprises the total data resource with stations space approximately 0.8 metres along the lines. A total of 103.6 of the 280 line-km are on the Mahogany Property.

Wright's (2020a) interpretation of the drone magnetics reveals an array of north-south structures cut by east-west to west-northwest structures, both of which find support in the regional data. Mapped alteration in the southwest corner of the survey correlate with north-south structures. These structures extend to the north end of the survey and should be considered target areas, particularly at the intersection with the cross-structure zone. Numerous other north-south structures are noted to the east in the survey area. Any of these with anomalous geochemical associations should also be considered targets.









The structures are based mostly on magnetic contrasts best defined by the horizontal gradient (HG) of the Reduced to Pole (RTP) magnetic data (Figure 16). Contrasts are marked by ridges in the HG, as well as terminations and offsets in the RTP. The structures form a north-south swarm with continuity across the survey area. Various strands of the swarm have been interpreted as offset by several east-west to west-northwest-trending structures in the middle of the claim block. The structural trends independently interpreted from the magnetic data are compatible with the orientations of faults mapped by Headwater geologists (Figure 5). Areas of highly variable magnetic response have been interpreted as magnetite-destructive hydrothermal alteration (Figure 16, Wright, 2020a). An interesting circular magnetic low is located east of the alteration polygons and labeled with ALT/ INT on Figure 16. The area of the magnetic pattern is not highly variable, indicating the magnetic low could well be an unaltered basaltic intrusion.

# 9.2.2 Katey Airborne Magnetic Survey

The Katey Property flight lines are oriented east-west and spaced at 100 m. A total of 168 linekm comprises the total data resource with stations spaced approximately 0.8 metres along the flight lines. Of the total 168 line-kilometres acquired, 68.88 line-kilometres are on the Katey Property.

Wright (2020b) provided a summary of the interpreted structures, lithologies and alteration with the mapped alteration (Figure 17). The interpretation is shown over topography with mapped argillic and silica alteration depicted with coloured polygons. Immediately apparent is the correlation of mapped alteration with the two main structural trends. A linear trend of argillic alteration with scattered silica extends over one kilometre across a large area of interpreted alteration (Figure 17). Extending in a northwest trend along the NW Cross Structure Zone are six mapped areas of both argillic and silica alteration. As noted, intersection of the two alteration trends coincides with a large area of interpreted alteration (Figure 17).



# Figure 17: Interpretation, Mapped Alteration over Topography





# **10 DRILLING**

Historic drilling at the Katey and Mahogany Properties took place between 1986 and 1990.

#### Mahogany Property

From 1988 to 1990 Chevron Resources completed eight reverse circulation holes, totalling 632.6 metres of drilling. Significant gold intercepts, estimated collar locations, and depths are summarized in Table 3. Approximate drill hole locations, derived from historic Manville maps are shown in Figure 18. Geological logs are not available for the historic drill holes.

Hole_ID	Year	Туре	Nad83E	NAD 83N	Total Depth (feet)	Totat Depth Meters	Azimuth	Significant Intercept
MH88-36-01	1988	RC	495988	4789770	350	106.71	330	35 ft of .0328 opt Au from 175-210'
MH88-36-02	1988	RC	496031	4789852	260	79.27	300	10 ft 0.048 opt Au from 115-125 '
MH88-36-03	1988	RC	496181	4789993	150	45.73	340	
MH88-25-01	1988	RC	496315	4790096	150	45.73	340	
MH89-36-04	1989	RC	496026	4789591	485	147.87	285	
MH89-36-05	1989	RC	496049	4789798	370	112.80	0	10 ft of 0.026 ppm Au from 360-370'
MH90-36-1	1990	RC	496019	4789962	275	83.84	220	
MH90-36-2	1990	RC	496247	4790126	35	10.67	0	
		Total			2075	632.62		

Table 3: Mahogany Property Historical Drilling

The UTM coordinates derived from historical maps georeferenced by Headwater.

#### **Katey Property**

In the late 1980's and early 1990's the Katey Property saw two companies undertake drill programs, both Manville and ASARCO. Significant gold intercepts are compiled in Table 4, and the of locations of the historic drill holes from Katey are shown in Figure 19.



# Table 4: Katey Property Historical Drilling

Hole_ID	Year	Туре	NAD83E	NAD83N	Total Depth	Total Depth	Azimuth	Company	Significant Intercepts
					(feet)	(meter)			
KTR-90-1	1990	RC	487911	4807974	500	152.44		Asarco	
KTR-90-2	1990	RC	487595	4807881	500	152.44		Asarco	
KTR-90-3	1990	RC	486920	4807363	500	152.44		Asarco	
KTR-90-4	1990	RC	486767	4807314	500	152.44		Asarco	
KTR-90-5	1990	RC	485150	4808280	500	152.44		Asarco	
KTR-90-6	1990	RC	486426	4807224	500	152.44		Asarco	
KTR-90-7	1990	RC	486650	4806867	500	152.44		Asarco	
KTR-90-8	1990	RC	487780	4807418	485	147.87		Asarco	
KTR-90-9	1990	RC	487993	4806597	260	79.27		Asarco	
KTR-89-1	1989	RC	487608	4807833	440	134.15		Asarco	
KTR-89-2	1989	RC	487578	4807802	390	118.90		Asarco	10 ft of 0.07 opt Au from 260' to 270'
KTR-89-3	1989	RC	486552	4807393	400	121.95		Asarco	
KTR-89-4	1989	RC	486653	4807309	400	121.95		Asarco	10 ft of 0.018 opt Au from 0' to 10'
KTR-89-5	1989	RC	486685	4807345	420	128.05		Asarco	120 ft of 0.02 opt Au from 0' to 120'
KTR-89-6	1989	RC	486925	4806768	420	128.05		Asarco	
K-88-1	1988	DDH	487700	4807778	80	24.39	330	Manville	3.5 ft of 0.081 opt Au from 8.8' to 12.2'
K-88-2	1988	DDH	487632	4807844	181.7	55.40	140	Manville	5 ft of 0.18 opt Au from 13' to 22'
K-88-3	1988	DDH	487611	4807829	36	10.98		Manville	
K-88-4	1988	DDH	487629	4807859	206.6	62.99		Manville	
K-88-5	1988	DDH	487667	4807824	174.5	53.20		Manville	
K-88-6	1988	DDH	487638	4807815	93	28.35		Manville	
K-88-7	1988	DDH	487635	4807836	85	25.91		Manville	5 ft of 0.061 opt Au from 0' to 5'
K-88-8	1988	DDH	487688	4807810	35.5	10.82		Manville	
K-88-9	1988	DDH	487637	4807825	75.9	23.14		Manville	
K-88-10	1988	DDH	487684	4807831	181.3	55.27		Manville	
									10 ft of 0.036 opt Au from 0' to 10' and 48 ft
K-88-11	1988	DDH	486669	4807326	376	114.63	5	Manville	of 0.018 opt Au from 155' to 203'
K-88-12	1988	DDH	486685	4807348	396	120.73	265	Manville	10 ft of 0.188 opt Au from 40' to 50'
K-88-13	1988	DDH	486679	4807378	655	199.70		Manville	
K-88-14	1988	DDH	486598	4807296	270.5	82.47		Manville	
K-88-15	1988	DDH	486650	4807281	218	66.46		Manville	
K-88-16	1988	DDH	486757	4807114	197	60.06		Manville	
K-88-17	1988	DDH	486802	4807077	82.5	25.15		Manville	
K-88-18	1988	DDH	487738	4807548	175.5	53.51		Manville	5.5 ft of 0.015 opt Au from 93' to 98.5'
									7 ft of 0.024 opt Au from 0' to 7' and 84.3 ft
K-88-19	1988	DDH	486592	4807369	274.3	83.63	125	Manville	of 0.021 opt Au from 190' to 274.3'TD
K-88-20	1988	DDH	486568	4807383	174.8	53.29		Manville	
K-88-21	1988	DDH	486579	4807317	117.3	35.76		Manville	
K-88-22	1988	DDH	486579	4807316	186	56.71		Manville	
K-88-23	1988	DDH	486819	4807124	364.4	111.10		Manville	
			Tota	l feet	11,351.8	3460.91			
RC= Reve	rse Ci	irculat	ion Drillin	g					
DDD= Dia	mond	Drill (	Core						

The UTM coordinates derived from historical maps georeferenced by Headwater.

















# **11 SAMPLING PREPARATION, ANALYSES, AND SECURITY**

Headwater Gold Inc. undertook exploration at Katey and Mahogany from September, 2019 to October, 2020. Exploration crews stayed in Jordan Valley and accessed the property daily via Highway 95 and Succor Creek Road.

### **Rock Sampling**

Rock chip sampling was carried out by three Headwater geologists and resulted in the collection of 123 rock samples from the Mahogany area and 26 samples from the Katey area. Rock samples consisted of grab and chip samples. Sample locations were recorded with industry standard handheld GPS units in NAD83 UTM coordinates. Other relevant data recorded in the field included lithology and alteration. Sample material was photographed, and a witness (specimen) sample retained for reference. Field data are entered in an Excel spreadsheet and then imported to a master SQL database.

The sample material was placed in marked Protexo bags. These bags were then placed in marked and sealed rice bags and hand-delivered by Headwater geologists to either ALS labs or American Assay labs, both located in Sparks, Nevada. Rock samples sent to American Assay (accredited assay Laboratory ISO/IEC 17025:2005) underwent 30-gram Lead-Fire Assay and 21 elemental ICP-OES analysis. Rock samples sent to ALS underwent analyses for Ultra Trace Aqua Regia ICP-MS (ME-MS41) and Au 50 g Fire Assay with an ICP-AES Finish (Au-ICP22), Ore Grade Ag Aqua Regia (Ag-OG46), Ore Grade Elements -Aqua Regia ICP (ME-OG46). ALS Minerals Reno is ISO/IEC 17025:2005 Accredited by the Standards Council of Canada.

### Soil Sampling

A total of 721 soil samples were collected over the Katey and Mahogany targets by Headwater personnel and contractors between June 28 and October 18, 2020. Sample locations were collected on east-west survey lines with 50 m spacing between sample sites. The north-south line spacing was 200 m except for the area of most intense alteration and mineralization at Mahogany, where the line spacing was reduced to 100 m. Sample sites were located in the field using handheld GPS units.

Soil samples were taken from substratum at depths of 30-70 cm using a shovel and plastic trowel. Sample material was taken from the bottom of each hole and sieved through a 12-mesh (1.7 mm) classifying sieve into Protexo soil sample bags. Sample ID, location in NAD83 UTM coordinates, and colour were recorded in the field and then imported to a master SQL database. Each sample bag was marked with a sample ID at the sample site, then placed in a rice bag that was then zap-trapped closed. Samples were delivered by Headwater personnel and contractors to ALS labs and American Assay labs in Sparks, Nevada.

Soils samples sent to American Assays Laboratories underwent 30-gram Lead-Fire Assay and 21 elemental ICP-OES analysis.



Soils samples sent to ALS Reno laboratory and underwent analysis for Ultra Trace Aqua Regia ICP-MS (ME-MS41) and Au 50 g Fire Assay with an ICP-AES Finish (Au-ICP22).

#### **Stream Sediment Sampling**

A total of 24 stream sediment samples were taken from 1<sup>st</sup> and 2<sup>nd</sup> order drainages at Mahogany. No stream sediment samples were taken at Katey. All drainages were dry. Sample material consisted of silt and sand taken from overbank and bedload deposits. The material was collected using a shovel and plastic spade, and sieved through a 12-mesh (1.7 mm) classifying sieve into Protexo sample bags marked with sample ID. At each sample site the location was recorded in NAD83 UTM coordinates using a handheld GPS. Site description including, components, moisture, lithology, and grain size were documented in the field and then transferred to a master SQL database. Samples were placed in rice bags, zap-strapped closed, and delivered by Headwater personnel to ALS labs in Sparks, Nevada. The samples underwent analysis for Ultra Trace Aqua Regia ICP-MS (ME-MS41) and Au 50 g Fire Assay with an ICP-AES Finish (Au-ICP22).

At this early prospective stage of the project, quality control was not undertaken by Headwater Gold Inc. ALS labs and American Assay labs are accredited and have their own Quality Control and Quality Assurance protocols for sample preparation and assaying. The author is of the opinion that the QA/QC use by the laboratory is sufficient for the size of the project.



#### **Drone Geophysics**

The 2020 airborne magnetic system used a Geometrics MagArrow Cesium Magnetometer flown under a DRTK DJI Matrice 600 Pro hexacopter. The MagArrow sensor takes 1,000 readings per second and is flown at a maximum speed of 12m/second. The sensor is suspended on a 2.5m lanyard to remove it from the electromagnetic noise of the UAV. The MagArrow readings are diurnally corrected via a GSM19 base mag, cycling at 2 readings per second. Flight lines were flown bearing N90 or N270 at a line spacing of 100 metres at approximately 34 metres above ground level with a tolerance of +/- 4 metres.

# **12 DATA VERIFICATION**

The author is satisfied with the adequacy of sample preparation, security, and the analytical procedures used on the Katey and Mahogany Properties. The author is of the opinion that the description of sampling methods and details of location, number, type, nature, and spacing or density of samples collected, and the size of the area covered are all adequate for the current stage of exploration for the Katey and Mahogany Properties.

During the site visit the author also examined the overall geological setting of the Katey and Mahogany Properties. The author reviewed the sample notes and assays results for the 2020 program and is satisfied that they meet current industry standards. The author randomly checked the assay certificates for one hundred assays from Headwater's exploration from the 2018-2020 sampling program and no discrepancies were identified.

The author examined the Mahogany Property on October 16, 2020, examined several locations and took four rock samples (see Figure 18 for author samples).

The author examined the Katey Property on October 17, 2020, examined several locations and took three rock samples (see Figure 6 for author samples).

The author took samples during the visit from seven locations and these were shipped to ALS Global - Geochemistry Analytical Lab in Reno, Nevada, USA. ALS Minerals Reno is ISO/IEC 17025:2005 Accredited by the Standards Council of Canada. All samples underwent assay package ME-MS61 which includes 48 element analysis, Au 50 g Fire Assay with an ICP-AES Finish (Au-ICP22), and the over limit gold sample underwent Au 50g by fire assay with a gravimetric finish (Au-GRA22). ALS Minerals Reno is independent of Headwater Gold Inc. and the author.

The author reviewed the provided drill logs and select assay sheets from the 1989 and 1990 drilling in the Katey Property. The data is of industry standard for the time period. There was no reported QA/QC for the 1989-1990 drilling.

On the Katey and Mahogany Properties the author observed the remnants of historical drill pads during the site visits. The author reviewed the satellite imagery that is found on Google Earth on



November 9, 2020 with an overlay of the provided historical drill hole collar locations. The ground disturbances from the 1980's and 1990's drilling is partially still visible in many instances. In the opinion of the author this represents an excellent verification of the collar locations of historical drilling.

While on Katey and Mahogany Properties the author observed several marker posts for the lode claim staking. The author also viewed select soils sample locations.

At the current stage of exploration, the geological controls and true widths of mineralized zones are not known and the occurrence of any significantly higher-grade intervals within lower grade intersections has not been determined.

Authors Sample	Headwater Sample No.	WGS84E	WGS84N	Original Au ppm	Original Ag ppm	Author Au ppm	Author Ag ppm
KM20-01	RX984619	495906	4789654	25.1	7.83	170	53.7
KM20-02	RX512448	495901	4789662	23	10.45	0.306	0.57
KM20-03	RX512445	495943	4789839	0.797	0.51	0.802	0.41
KM20-04		496136	4790022			0.162	0.72
KM20-05	RX173464	486647	4807319	1.99	6.91	1.48	7.39
KM20-06	RX173466	486624	4807358	0.603	3.29	0.055	0.7
KM20-07	RX512441	487698	4807848	0.40	12.15	0.796	5.19
Mah	nogany Samp	les					
К	atey Samples						

Table 5: Author Collected Samples

The author's collected samples verify that there is gold present on the Katey and Mahogany Properties. The gold values from the samples taken by the author are congruent with samples taken by Headwater Gold Inc. In fact, sample KM20-01 gave an excellent gold value of 170 ppm and 53.7 ppm Ag.

Katey and Mahogany Properties NI 43-101- 2020



Figure 20: Author Observed 2020 Soil Site



Figure 21: Author Sample KM20-01



Figure 22: Katey Property



Figure 23: Claim Post Mahogany Property



Figure 24: Mahogany Property Access





# 13 MINERAL PROCESSING AND METALLURGICAL TESTING

This is an early-stage exploration project, and to date no metallurgical testing has been undertaken on the Katey and Mahogany Properties.

# **14 MINERAL RESOURCE ESTIMATE**

This is an early-stage exploration project; there are currently no mineral resources estimated for the Katey and Mahogany Properties.

# 15 THROUGH 22 ARE NOT APPLICABLE TO THIS REPORT

Items 15 through 22 of Form 43-101F1 do not apply to the Property that is the subject of this technical report as this is not an advanced property.

# **23 ADJACENT PROPERTIES**

Approximately 20 kilometres southeast of Mahogany Property geologically on trend, is the DeLamar project. The following is a direct extract on the geology for the DeLamar project from Gustin et al., 2019.

"The DeLamar project is situated in the Owyhee Mountains near the east margin of the mid-Miocene Columbia River – Steens flood-basalt province and the west margin of the Snake River Plain. The Owyhee Mountains comprise a major mid-Miocene eruptive center, generally composed of mid-Miocene basalt flows intruded and overlain by mid-Miocene rhyolite dikes, domes, flows and tuffs, developed on an eroded surface of Late Cretaceous granitic rocks. The DeLamar mine area and mineralized zones are situated within an arcuate, nearly circular array of overlapping porphyritic and flow-banded rhyolite flows and domes that overlie cogenetic. precursor pyroclastic deposits erupted as local tuff rings. Integra interprets the porphyritic and banded rhyolite flows and latites as composite flow domes and dikes emplaced along regionalscale northwest-trending structures. At Florida Mountain, flow-banded rhyolite flows and domes cut through and overlie a tuff breccia unit that overlies basaltic lava flows and Late Cretaceous granitic rocks. Gold-silver mineralization occurred as two distinct but related types: (i) relatively continuous, guartz-filled fissure veins that were the focus of late 19thand early 20thcentury underground mining, hosted mainly in the basalt and granodiorite and to a lesser degree in the overlying felsic volcanic units; and (ii) broader, bulk-mineable zones of closely-spaced guartz veinlets and guartz-cemented hydrothermal breccia veins that are individually continuous for only a few feet laterally and vertically, and of mainly less than 1.3 centimetres in width-predominantly hosted in the rhyolites and latites peripheral to and above the quartz-filled fissures. This second style of mineralization was mined in the open pits of the late 20thcentury DeLamar and Florida Mountain operations, hosted primarily by the felsic volcanic units.

The fissure veins mainly strike north to northwest and are filled with quartz accompanied by variable amounts of adularia, sericite or clay,  $\pm$  minor calcite. Vein widths vary from a few



centimetres to several metres, but the veins persist laterally and vertically for as much as several hundreds of metres. Principal silver and gold minerals are naumannite, aguilarite, argentite, ruby silver, native gold and electrum, native silver, cerargyrite, and acanthite. Variable amounts of pyrite and marcasite with very minor chalcopyrite, sphalerite, and galena occur in some veins. Gold-and silver-bearing minerals are generally very fine grained.

The gold and silver mineralization at the DeLamar project are best interpreted in the context of the volcanic-hosted, low-sulphidation type of epithermal model. Various vein textures, mineralization, alteration features, and the low contents of base metals in the district are typical of shallow low-sulphidation epithermal deposits worldwide".

The DeLamar project resources, which include the resources for both the DeLamar and Florida Mountain areas, are summarized in Table 6. Mineral resources that are not mineral reserves do not have demonstrated economic viability. Table 6 was taken from "*Technical Report and Preliminary Economic Assessment for the DeLamar and Florida Mountain Gold-Silver Project, Owyhee County, Idaho, USA: NI 43-101 report prepared for Integra Resources Corp.*" dated September 9, 2019 (Gustin et al. 2019).

Classification	Tonnes	g Au/t	oz Au	g Ag/t	oz Ag
Measured	16,078,000	0.52	270,000	34.3.	17,726,000
Indicated	156,287,000	0.42	2,106,000	19.7.	98,788,000
Measured + Indicated	172,365,000	0.43	2,376,000	21.0.	116,514,000
Inferred	28,266,000	0.38	343,000	13.5.	12,240,000

1. Mineral Resources are comprised of all oxidized and transitional model blocks at a 0.2 g AuEq/t cut-off and all unoxidized blocks at a 0.3 g AuEq/t that lie within optimized pits.

2. The effective date of the resource estimations is May 1, 2019.

3. Mineral resources that are not mineral reserves do not have demonstrated economic viability.

4. Rounding may result in apparent discrepancies between tonnes, grade, and contained metal content.

The qualified person has been unable to verify the information on the adjacent property and the information disclosed is not necessarily indicative of mineralization on the Katey and Mahogany Properties that are the subject of the technical report.

# 24 OTHER RELEVANT DATA AND INFORMATION

The author is not aware of any historical production on the Katey and Mahogany Properties. The author is not aware of any environmental liabilities associated with the Katey and Mahogany Properties.



# **25 INTERPRETATION AND CONCLUSIONS**

The Katey and Mahogany Properties are hot-spring-type low sulphidation gold prospects. The historical work by Manville, ASARCO, and Chevron appears to have been of good quality. The previous workers were clearly focused on shallow, bulk tonnage targets. The untested targets are structurally controlled zones at slightly greater depth which conventional models of low sulphide epithermal deposits predict to be the main mineralization zone in such systems.

#### **Mahogany Property**

A review of public reports, theses, and research papers indicates that Mahogany lies near the eastern margin of a broad and shallow graben complex that extends hundreds of kilometres along strike and is referred to as the Oregon-Idaho Graben.

The Main Ridge Fault, along which the highest gold values from rock chips were sampled, is a very steep north-striking normal fault that is almost certainly related to the graben complex. This makes the Main Ridge Fault distinct from northwest-striking normal faults that are mapped all over the property and follow a regional structural fabric that extends southwest tens of kilometres. Milky quartz veins and weak silicification occur along many of northwest-striking faults; however, thorough prospecting and sampling has yielded only very weak trace element anomalies and no precious metals.

Drone magnetics revealed the extent of basaltic dikes and concordant bodies that could be flows or shallow sills in the vicinity of Mahogany. Though no felsic flows were encountered in mapping, middle Miocene bimodal volcanism was ubiquitous in the vicinity of Mahogany. The Mahogany epithermal system was probably driven by local, relatively shallow igneous activity. Exploration work to date at Mahogany, including rock chip sampling, soils, mapping, and drone magnetics, all point to the mineralized segment of the Main Ridge Fault as the primary target. Detailed mapping suggests fluids may have been localized along a structural intersection of the Main Ridge Fault with one or more small faults in the hanging wall (to the east). The strike and dip of the Main Ridge Fault is remarkably well constrained from mapping the trace across topography with the aid of public LiDAR elevation data. The Main Ridge Fault has normal displacement and dips >80° east. Such a steep dip is typical of rift-related normal faults, which steepen to near vertical near the free surface.

### **Katey Property**

Historic exploration work at Katey was more extensive than at Mahogany. Therefore, Headwater put proportionally more effort into compiling, confirming, and refining historical work by Manville and ASARCO. The Headwater soil survey was designed to fill gaps in the historical survey and overlap in key mineralized areas, including the East Zone and the West Zone. Though the ASARCO soil survey analysed only Au, Hg, and As, good correlation exists in these elements in the overlap areas of the Headwater and ASARCO datasets.

Drone magnetics yield contrasting magnetic domains on either side of a north-northwest-trending structural zone at Katey target. The mag results generally support the interpretation that the Katey



prospect lies astride the margin of a mid-Miocene caldera. The east half of the property is characterized by both strong magnetic lows, interpreted as flat-lying basalts, and strong magnetic highs, interpreted as rhyolites. The western portion of the property has very little magnetic signal. Mapping indicates the western part of the property is comprised of fluvial and lacustrine sediments and an intra-caldera tuff. The structural zone that juxtaposes the two domains is an important target that was shallowly tested by historic East Zone drilling and should be tested down-dip with inclined drill holes by Headwater. The West Zone target has almost no magnetic response.

# **26 RECOMMENDATIONS**

A drill program is warranted. The following four target areas are intended to test the presence of low-sulphidation bonanza-type veins beneath high-level alteration assemblages mapped at surface and listed in order of priority. Historical drilling was almost entirely focused on gold mineralization at depths of less than 150 m in the vicinity of Breccia Hill Main, Ridge Fault, Windy Ridge Breccia, and West Zone.

A drill program consisting of angled holes to pierce the fault plane at depths of approximately 150 m, thereby testing high-grade targets predicted to occur 100 - 400 m below the paleosurface.

Drill test the West Zone on the Katey Property with oriented core, following up the best historic intercepts and aiming to better define the orientation of mineralized structures.

Drill test the Breccia Hill Main, Ridge Fault, and Windy Ridge Breccia, on the Mahogany Property with oriented core, following up the best historical intercepts and aiming to better define the orientation of mineralized structures.

Area		No Metres	Cost USD
	All in cost for Drilling, road remediation pad building,		
	assays, Mod-Demob, geologist is \$377 USD per		
Mahogany	metre	3,000	\$ 1,131,000
	All in cost for Drilling, road remediation pad building,		
	assays, Mod-Demob, geologist is \$377 USD per		
Katy	metre	3,000	\$ 1,131,000
			\$ 2,262,000

Table 7: Proposed Budget



# 27 REFERENCES

Bonham, H.F. Jr., 1988, Models for volcanic-hosted epithermal precious metal deposits, in Schafer, R.W., Cooper, J.J., and Vikre, P.G. eds., Bulk Mineable Precious Metal Deposits of the Western United States, Symposium Proceedings, The Geological Society of Nevada, p. 259-271

Bonnichsen, W., 1983, Epithermal Gold and Silver Deposits, Silver City-De Lamar District, Idaho, Idaho Geological Survey Technical Report 83-4, 34 p.

Bureau of Land Management Oregon/Washington State office Oregon/Washington Information Guide Locating Mining Claims (October 2020) https://www.blm.gov

Cummings, M.L., 1991, Relationships among volcaniclastic sedimentation, volcanism, faulting, and hydrothermal activity west of Lake Owyhee, Malheur County, Oregon, in Geology and Ore Deposits of the Great Basin: Geological Society of Nevada, Symposium Proceedings, v2, p. 111-132.

Cummings, M.L., Evans, J.G., Ferns, M.L., Lees, K.R., 2000, Stratigraphic and Structural Evolution of the Middle Miocene Synvolcanic Oregon-Idaho Graben, GSA Bulletin, v. 112; no. 5; p. 668–682.

Ekren, E.B., McIntyre, D.H., Bennett, E.H., and Malde, H.E., 1981, Geologic map of Owyhee County, Idaho, west of longitude 116°W: U.S. Geological Survey Miscellaneous Investigations Series Map I-1256, scale 1:125 000.

Ekren, E.B., McIntyre, D.H., Bennett, E.H., and Marvin, R.F., 1982, Cenozoic stratigraphy of western Owyhee County, Idaho, in Bonnichsen, B., and Breckenridge, R.M., eds., Cenozoic geology of Idaho: Idaho Geological Survey Bulletin 26, p. 215–235

Ellingwood, S.G., 1988 Katey Claims Resistivity, Manville Internal Correspondence June 20,

Ferns, M.L., 1997, Field Trip guide to the easter margin of the Oregon-Idaho graben and middle Miocene calderas of the Lake Owyhee volcanic field. Oregon Geology Volume 59 number 1

Ferns, M.L., and Gilbert, D., 1992, Preliminary Geologic Map of the Rockville Quadrangle, Malheur County, Oregon: Oregon Dept. of Geology and Mineral Industries Open File Report O-92-12, scale 1:24,000.

Gilbert, D., 1988, Geology and Geochemistry of the Mahogany Hot-Springs Gold Prospect in the Owyhee Region of Southeastern Oregon, unpublished Master's thesis, Portland State University, 108 p.

Gustin M.M., Weiss, S.I., Dryer, T. L, McPartland, J. S., Woods, J. L., Welsh, L. D., 2019 (September), Technical Report and Preliminary Economic Assessment for the DeLamar and Florida Mountain Gold-Silver Project, Owyhee County, Idaho, USA: NI 43-101 report prepared for Integra Resources Corp.,317 as found on SEDAR

Hasten, Z., 2012, Mid-Miocene Magmatism in the Owyhee Mountains, ID: Origin and Petrogenesis of Volcanic Rocks in the Silver City District, Unpublished Master's Thesis, Kansas State University, 222 p.

Hedenquist, J.W., 1986, Precious metal vein systems in the National District, Humbolt County, Nevada – a discussion: Econ. Geol., v. 81, p. 1020-1023.

Malheur County, Oregon: U.S. Geological Survey Miscellaneous Field Studies Map ME-1901, scale 1;24,000. Walker, G.W., 1970, Cenozoic ash-flow tuffs of Oregon: State of Oregon Department of Geology and Mineral Industries, v. 32, no. 6, p. 97-115.

Plouff, Donald, 1987, Gravity observations by the U.S. Geological Survey in Northwest Nevada, southeast Oregon, and northeast California, 1984-1986: U.S. Geological Survey Open-File Report 87-639, 33 p.



Rytuba, J. J., Vander Meulen, D.B., and Minor, S.A., 1989, Geologic evolution of the Three Fingers caldera, Malheur Co., Oregon. Geological Society of America Abstracts with Program, Cordilleran and Central Region Section Meeting, v. 21, no. 5, p. -138.

Rytuba, J. J 1989 Volcanism extensional tectonics, and epithermal mineralization in the northern Basin and Range province, California, Nevada, Oregon, and Idaho, in Schindler, KS., ed., USGS research on mineral resources - program and abstracts: Fifth Annual V.E. McKelvey Forum on Mineral and Energy Resources, U.S. Geological Survey Circular 1035, p. 59-61.

Rytuba, J.J., and McKee, E.H., 1984, Peralkaline ash-flow tuff and calderas of the McDermitt volcanic field, southeast Oregon and north-central Nevada: Journal of Geophysical Research, v. 89, no. B10, p. 8616-8628.

Rytuba, J.J., and Vander Muelen, D.B., 1991, Hot-spring precious metal systems in the Lake Owyhee Volcanic Field, Oregon-Idaho, in Geology and Ore Deposits of the Great Basin: Geological Society of Nevada, Symposium Proceedings, v2, p. 1085-1096.

Rytuba, J.J., Vander Meulen, D.B., Barlock, V.E., and Ferns, M.L., Field guide to Hot-Spring Gold Deposits in the Lake Owyhee Volcanic Field, Eastern Oregon, Geological Society of Nevada 1990 Field Trip Guidebook Field Trip No. 10, p. 1-30.

Rytuba, J.J., Vander Meulen, D.B., Plouff, Donald, and Minor, S.A., 1985, Geology of the Mahogany Mountain caldera, Oregon [abs.]: Geological Society of America Abstracts with Programs, v. 17, no. 4, p. 70.

Sillitoe, R.H., and Hedenquist, J.W., 2003, Linkages between volcano tectonic settings, ore-fluid compositions, and epithermal precious-metal deposits. Society of Economic Geologists Special Publication 10, p. 315–343

Vander Meulen, D.B., 1989, Intra-caldera tuffs and central-vent intrusion of the Mahogany Mountain Caldera, eastern Oregon: U.S. Geological Survey Open-File Report 89-77, 58 p., 2 plates, scale 1:72,750.

Wright, J.L., 2020a (September), Mahogany Property Airborne Magnetic Survey Report: prepared for Headwater Gold Corp prepared by Wright Geophysics, 18 p.

Wright, J.L., 2020b (September), Katey Property Airborne Magnetic Survey Report: prepared for Headwater Gold Corp prepared by Wright Geophysics, 16 p.

Zimmerman, B.S., 1991, Geology and geochemistry of epithermal gold mineralization in the Lake Owyhee volcanic field—Western Snake River plain region of eastern Oregon and western Idaho [Ph.D. dissert.]: Pullman, Washington State University, 262 p.



# 28 CERTIFICATE OF AUTHOR

I am a consulting geologist at 1251 Cardero Street, Vancouver, B.C.

This certificate applies to the technical report entitled "NI 43-101 on the Katey and Mahogany Properties, Malheur County, Orogen United States" with an effective date December 27, 2020.

I am a graduate of Concordia University of Montreal, Quebec, with a B.Sc. in Geology, 1993. I am a Practicing Member in good standing of the Association of Professional Engineers and Geoscientists, British Columbia, license number 278779, since 2003. I have been practicing my profession continuously since 1993 and have been working in mineral exploration since 1986 in gold, precious, base metals, coal mineral, and diamond exploration. During which time I have used, applied geophysics/ geochemistry, across multiple deposit types. I have worked throughout Canada, United States, China, Mongolia, South America, South East Asia, Ireland, West Africa, Papua New Guinea, and Pakistan.

I have read the definition of "qualified person" set out in National Instrument 43-101 ("NI 43-101") and certify that by reason of my education, affiliation with a professional organization (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.

I visited the Mahogany Property on October 16, 2020 and Katey Property on October 17 2020.

I am responsible for and have read all sections of the report entitled "NI 43-101 on the Katey and Mahogany Properties, Malheur County, Orogen United States" dated December 27, 2020.

I am independent of Headwater Gold Inc applying the tests in section 1.5 of National Instrument 43-101. For greater clarity, I do not hold, nor do I expect to receive, any securities of any other interest in any corporate entity, private or public, with interests in the Katey and Mahogany Properties. The Katey and Mahogany Properties that is the subject of this report, nor do I have any business relationship with any such entity apart from a professional consulting relationship with Company. I do not hold any securities in any corporate entity that is any part of the subject Katey and Mahogany Properties.

I have no prior involvement with the Katey and Mahogany Properties that is the subject of the Technical Report.

I have read National Instrument 43-101, Form 43-101F1, and this technical report and this report has been prepared in compliance with the Instrument.

As of the effective date of this technical report I am not aware of any information or omission of such information that would make this Technical Report misleading. This Technical Report contains all the scientific and technical information that is required to be disclosed to make the technical report not misleading.

NI 43-101 on the Katey and Mahogany Properties, Malheur County, Orogen United States", with a signature and effective date December 27, 2020.

"Original Signed and Sealed" On this day December 27, 2020 Derrick Strickland P. Geo.