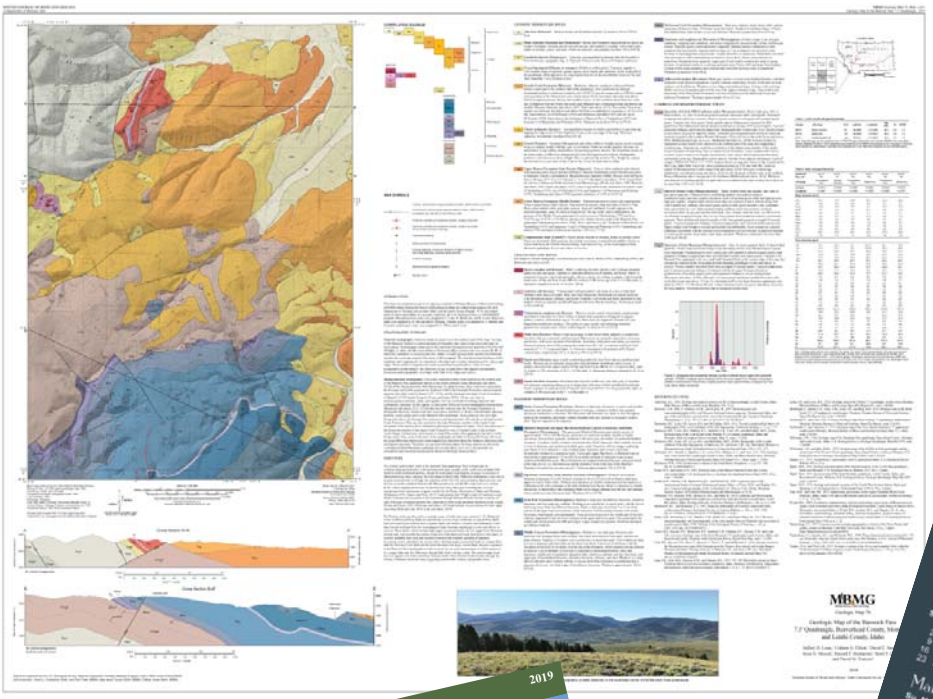
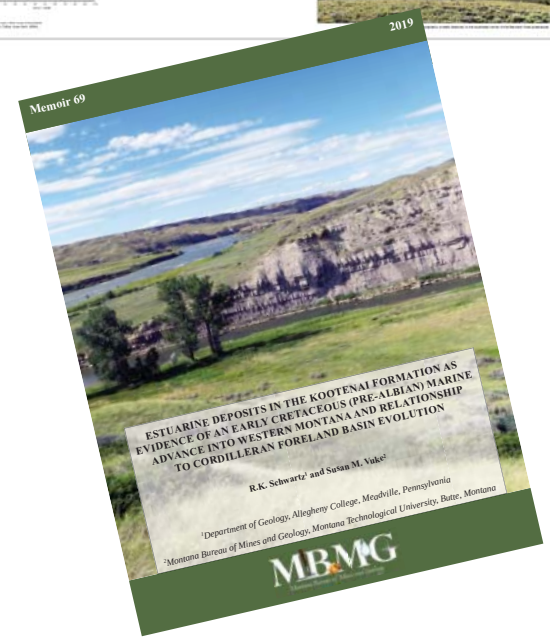
MBMG

Montana Bureau of Mines and Geology





Author Guide
2019

CONTENTS

INTRODUCTION

The MBMG Author's Guide presents an overview of the MBMG publication process and provides authors with a quick reference guide to assist in planning and preparing manuscripts for publication. The Suggestions to Authors of the Reports of the United States Geological Survey (STA; available online at https://pubs.er.usgs.gov/publication/7000088) should be your primary resource as you prepare reports, maps, and other documents. Rather than duplicating information covered extensively in the STA, this guide presents MBMG-specific information in the form of summaries, quick lists, definitions, and examples to help clarify frequently asked questions. We suggest best practices for technical and map reviews, and also include a list of supplementary references and links to additional resources. We hope this guide is a useful reference for you!

LOCATION AND FORMAT

This guide is published in PDF format to make the information easily available while preparing your manuscript. The PDF file is located on the MBMG network (Publications Public\MBMG AuthorGuide).

You can also get a printed, bound copy of this guide from the Publications department.

RELEVANT STAFF/CONTACT INFORMATION

At the time of this revision, relevant staff are as follows:

Director: John Metesh, 496-4159, jmetesh@mtech.edu

Research Chief: Madeline Gotkowitz, 496-4153, 608-335-1668, mgotkowitz@mtech.edu

Publications Editor/Chief of Information Services: Susan Barth, 496-4687, sbarth@mtech.edu

Geologic Cartographer/Graphic Designer: Susan Smith, 496-4173, ssmith@mtech.edu

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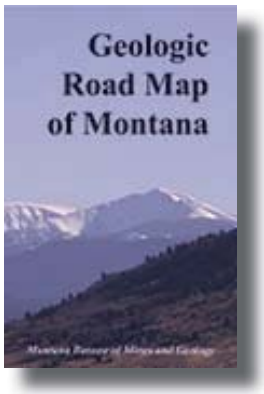


MBMG PUBLICATION SERIES

All MBMG publications fall into one of two broad categories: formal publications or open-file reports. The MBMG has 14 current series types. The Director, Research Division Chief, and Editor will work with the author and their supervisor to determine publication series classification based on the purpose, scope, distribution, and level of technical and editorial review required.

Below is a list of MBMG publication series with the description and level of review typically required for each.

MBMG Publication Series and Review Guidelines

Series Name	Description	Reviews				
		Program Manager	Internal Peer	External Peer	Res. Div. Chief	Director
Memoirs (M)	Comprehensive scientific reports covering broad topical or geographic scope and of long-term importance. Included are reports of mineral resource studies, hydrogeologic studies, and geologic investigations.	MBR	1	2	x	x
Bulletins (B)	Publications involving significant data and interpretations of lasting scientific interest.	MBR	1	2	x	x
Digital Publications (DIGITALPUB)	These are publications that are only released on the website or in other digital forms, but still require technical and editorial review.	MBR	1	MBR	x	x
Geologic Map (GM)	Maps on various geologic themes that typically include descriptive text, geologic cross sections, correlation and other charts, tables, analytical data, and stratigraphic sections. External review will be required for 1:100k scale maps.	x	2	MBR	x	x
Ground-Water Open-File Reports (GWOF)	Manuscripts and maps dealing with various groundwater issues in Montana produced as ancillary documents by the Ground-Water Assessment Program.	x	1	MBR	x	x
Hydrogeologic Map (HM)	Mapped areas and presentations dealing principally with groundwater resources and investigations that may include descriptive text, charts, tables, analytical data, etc.	MBR	2	1	x	x
Information Pamphlet Series (IP)	Generalized brief discussions of the earth sciences.	MBR	1	1	x	x
Miscellaneous Contributions (MC)	Administrative reports, primary data tabulations, directories, bibliographies, indexes, and catalogs.	MBR	1	MBR	x	x
Miscellaneous Publications and Maps (MISC)	Any maps or publications that do not fit into the other categories. Calendars and postcards are in this category.	MBR	MBR	MBR	x	x
Montana Atlas (MA)	Depicts geology, groundwater resources, mineral resources, and other subjects in a portfolio format.	MBR	2	1	x	x

Montana Ground-Water Assessment Atlas (GWAA)	Descriptive overviews and maps interpreting groundwater resources of selected areas. Maps are released as open-file versions until formal review is completed.	x	2	1	x	x
Open-File Reports (MBMG)	Preliminary manuscripts, maps, and other material made available for public use but not considered part of the formal literature. In addition to textual documents, an open file can be a set of data with a short explanation, a bibliography, a map, or an appendix to a formal publication. Open-file reports are often read through by the editor to correct grammar, spelling, and punctuation, and to regularize style. Generally, the editorial effort includes layout and checking references, but not rewriting. Exceptions can be made depending on availability of editorial staff.	MBR	1	MBR	x	x
Report of Investigation (RI)	Reports covering narrowly focused areas of study.	MBR	2	1	x	x
Special Publications (SP)	Compilations of interpretive works such as conference proceedings and guidebooks.	MBR	2	1	x	x
Reprint Series (R) Series no longer used	Reprints of selected out-of-print publications.	--	--	--	--	--

Notes. X, review is required. 1 or 2, number of reviews required; may be changed at the discretion of the RDC or Director. MBR, may be required; additional reviews may be required at the RDC or Director's discretion based on the complexity of content or if review by external project partners is warranted. A program manager review is recommended for all documents and may be required for some programs.

MBMG PUBLICATION PROCESS

General MBMG publications, including open-file reports, go through the same basic process to publication, tracked with our Trello Publication Board:

1. Author fills out a submission form to Trello detailing the basics of the proposed publication. (https://docs.google.com/forms/d/e/1FAIpQLSfxN2-Ilc9TLmWvXZQGPGa43zL2X63dX0DGK-FW-EqzQqr8GQQ/viewform)
2. A member of the Publications Committee (Director, Research Chief, Editor) will contact Author to set up a launch meeting to discuss the publication, understand what is involved, and make preliminary decisions as to publication type and due date. Supervisors and/or Program Manager may be included in this meeting.
3. Author writes the report draft, with guidance from their supervisor. Author submits a draft to their Program Manager for review. **Author should work with Cartographer/Graphic Designer on figures during this process.**
4. Author submits an approved draft to the Research Chief for “gateway review” (detailed on the following pages.)
5. Author does additional work if necessary; otherwise the manuscript moves to peer review, managed by the Research Chief. This review may be either internal or external, or both.
6. After receiving peer reviews, Research Chief completes a technical review.
7. Author responds to peer and Research Chief reviews. Once complete, Research Chief reviews again.
8. After approval, the Director reviews the completed manuscript.
9. After Director approval, the manuscript moves to the Publications Department queue. Editor will review materials, and check with author to make sure all material is there.
10. Editor performs a copyedit on the text, and reviews the figures and tables. Editor sends edits to Author for review. Depending on workload, open-file reports may receive a less rigorous edit than formal publications.
11. After Author reviews edits and makes changes, the Editor takes the final text and final figures and lays them out for publication in MBMG style, with assistance as needed from the Cartographer/Graphic Designer.
12. Author, and possibly Program Manager, reviews the laid-out version and marks up changes.
13. Editor makes final changes and releases the publication to the public, both on the website and makes it available the Publication Sales Office for sale. Editor or Social Media Coordinator will announce on social media/Tech website/local media if appropriate.

Story Maps, Apps, and other Digital Publications

A publication is much more difficult to define now than even 10 years ago; new software and internet technology provides exciting new opportunities to present our work. In general, story maps, applications that bring users to our site, compilations of existing data with new base maps, and similar products are subject to review for QA/QC as well as for appearance, style, and copyrights. In a manner similar to traditional publications, planning is imperative and starts with a proposal that leads to a clear work plan for design and maintenance involving several individuals (GIS, Pubs, etc.) other than the author. The proposal, constructed by author and support personnel, should address: (1) appropriateness of topic and level of detail; (2) feasibility with respect to content and staff time; (3) will it compete or complement other efforts; (4) compliance with MBMG apps or website; (5) compliance with MBMG style; and (6) long-term maintenance and usage monitoring. The starting place for all digital publications is to meet (individually or as a group) with your supervisor, program manager, or Research Division Chief to develop a preliminary design and plan. With few exceptions, story maps are a presentation of an existing or planned standard publication. A meeting with the webpage and database managers will provide guidance for specific design elements and system requirements.

The review and publication process for Story Map and other Digital Publications is similar to that for traditional publications above:

1. Author proposes Story Map to Supervisor/Program Lead.

2. Author and Supervisor meet with Director, Research Chief, Editor, and Web Manager to discuss parameters, ensure no repetition with other projects, and decide timeline. Following Supervisor approval, Author submits a card to the Trello Publication Board.

3. Author creates map.

4. Author secures permission for any outside images used in map. See page 17 of this document for more details.

5. Research Division Chief organizes peer reviewers.

6. Peers review map.

7. Author makes required changes.

8. Research Chief and Director review map.

9. Author makes required changes.

10. Director signs off on map.

11. Author sends story map link to Editor.

12. Editor edits map for grammar, clarity, and style, as well as checking permissions and links. Cartographer/Graphic Designer can assist with any final figure edits. Web personnel can assist with any technical issues.

13. Map goes back to Author for review of edits and corrections.

14. Following Author review and approval, maps may be released to the public.

15. Web department is notified so map can be linked on MBMG website, and Editor or Social Media Coordinator will announce on social media/Tech website/local media if appropriate.

MBMG REVIEW PROCESS

The publication process at the MBMG has evolved over time. The review and production process supports these goals:

1. MBMG's publications contain data, analyses, and interpretations that are technically correct, rigorous, and generally conform to accepted scientific practices in the geologic and hydrogeologic professions.

2. MBMG's publications have been subject to a review that is objective and independent from individuals and organizations with a vested interest in the information.

3. The publication review process is timely, useful, and constructive for MBMG authors and program areas (mapping, GWIP, GWAP, etc.).

4. MBMG publications are internally consistent in style, free of grammatical and typographical errors, visually appealing, and readily available to the public. The writing style is appropriate for the needs of specific audiences.

Types of review

The publication process involves several types of review. Informal reviews are sought out by authors at early stages of writing. Program areas (for example GWIP or GWAP) may have specific requirements for reports or maps, and a review by the Program Manager may be required prior to submitting the report for formal MBMG review. The Geologic Map review process is different and is described separately below. Gateway review, technical reviews, and editorial reviews are parts of the formal process.

Informal Reviews

Informal reviews are voluntarily sought by the author, at any stage of writing, to improve a manuscript. There is nothing like a pair of fresh eyes to improve an early draft.

Authors can ask co-authors, co-workers, managers, the editor, the RDC, or the director to provide informal reviews. An early read-through of a manuscript should focus on high-level organization and technical issues. Informal reviews often include specific aspects of the draft, such as clarity, organization, data presentation, and constructing logical arguments to support interpretations and conclusions. The author might ask a colleague to review just a portion of a manuscript that falls within their area of expertise. These reviews may also focus on editorial issues, such as grammar and style.

Examples of comments typical of an early review include:

• Consider adding a methods section to hold the well construction definitions, analytical methods, and the rationale for using TDS as a general indicator of water quality. Include definition of potable water for humans and stock, and acceptable water quality for irrigation use.

• The third paragraph on page 4 has too much detail; this is pretty basic stuff about managing data in a GIS. It detracts from substantive parts of the paper.

• Lines 525 -527 Is this too many significant digits to report? I'm not familiar with this statistical approach; does this mean that wells in this region are three times more likely to have arsenic exceeding 5 ppb?

• Line 694 refers to 20 wells in the Coastal Plain aquifer but the conclusions section refers to 30 wells in that system.

Publication Gateway Review

The Research Division Chief will provide a "gateway review" of materials submitted by the author to determine if a manuscript is ready for peer review. A well-organized manuscript that meets some basic requirements will allow peer reviewers to focus on substantive, technical aspects of the document. The RDC may return the manuscript to the author for additional preparation if the manuscript does not generally meet these requirements.

When authors submit a manuscript for gateway review, it should be reasonably clear and well-written, spell-checked, and free of typos. Figures should be prepared and presented so that a reviewer can easily read numbers, labels, legends, etc. References should be cross-checked to ensure that those listed in the references section are those that are cited in the text, figures, or plates. Authors may follow the checklist below to ensure their manuscript is ready for technical review. This preparation allows technical reviewers to evaluate scientific aspects of the work, such as description of methods, presentation of data and analyses, and interpretations.

Manuscripts submitted for gateway review should include the text in a single Microsoft Word document or equivalent, with continuous line numbers and page numbers. Figures and captions may be compiled in a separate file or included in the Word file. Although not required at this stage of review, all native graphic files should be kept separately for publication production. Tables may be compiled in a separate, single Word or Excel document, or included within a text file with captions (note that a separate Word or Excel document for each table is needed for layout during publication production). Appendices can be provided for review as separate files or included in the primary Word file.

Bulletins, Reports of Investigations, and other manuscripts that are in a report format (as opposed to a Map or Information Pamphlet) will typically include a Table of Contents, Abstract or Executive Summary, Introduction, Methods, Results, Discussion, Conclusions, Acknowledgments, and References.

The Gateway Review checklist is on the following page.

Gateway Review Checklist

Date:
Manuscript:
First Author:
Series:
Documents submitted:

1. Text _____
2. Figures and captions _____
3. Tables _____
4. Appendices _____

Report elements	Included?
Table of contents	
Abstract	
Introduction	
Methods	
Results	
Discussion	
Conclusions	
Acknowledgments	
References	

Is this sufficiently organized for technical review? _____

Is it reasonably clear and well-written? _____

Spell-checked, typos, cross-checked references? _____

Is the vocabulary appropriate for the publication series/intended audience? _____

Geologic Map Review

Review of geologic maps differs in some ways from review of other types of MBMG publications. This is driven in large part by issues specific to funding through the STATEMAP program. The MBMG geologic mapping program and the map publication process are tightly linked to support a productive, efficient, and high-quality program that meets external (USGS) deadlines.

The Geologic Maps (GM) series is the primary avenue for map publication. Required reviews are generally internal (that is, provided by MBMG staff) and guided by the Program Manager. The STA contains useful guidelines and checklists for review of geologic maps and cross sections. Peer review of a geologic map by an expert external to the MBMG may be required or requested, at the author's or Program Manager's discretion. External review will be encouraged and, in most cases, will be required by the Program Manager for 1:100K maps. Identifying external reviewers who are familiar with the geology depicted on the map and who can do a thorough technical review may be time consuming and can slow the publication process. However, 1:100K maps often represent the synthesis of many years of fieldwork and scientific interpretation; external review of these maps will support the continued excellence of MBMG geologic maps.

Technical Reviews

MBMG publications cover a wide range of topics and provide highly technical information to a variety of audiences. Although these publications are diverse in nature, the primary purpose of a technical review remains the same across publication series. Technical reviews are performed to help the author improve the manuscript from a scientific viewpoint. Constructive technical reviews focus on the content of the manuscript and identify areas where changes will clarify or strengthen interpretations and conclusions. In some cases, external technical reviews will be sought from users of MBMG publications; these reviews may be more applied in nature and focus on the usability of the material. A thorough review can be of tremendous benefit to the author and will support high-quality publications from the MBMG. The goal of the review process is a manuscript suitable for publication. If you are reviewing a manuscript that seems to you to require additional work, you can provide a useful review by laying out the elements (further data analysis, additional data collection, concise writing, etc.) needed for the next version.

Technical reviews should consider high-level questions about the manuscript. The list that follows is compiled from guidelines published by the National Academies of Sciences, Engineering and Medicine; Elsevier Publishing; and the journal Groundwater.

- Is the objective and scope of the work clearly stated?
- Is the organization of the manuscript effective?
- Does the title describe the work?
- Are methods, data, and analyses clearly presented?
- Are assumptions and limitations of the methods and analyses clearly stated?
- Are conclusions and recommendations directly supported by the data, analyses, and interpretation?
- Are broad, general statements that are not foundational to the science adequately supported by references?
- Do statements and conclusions go beyond the objectives and scope? Are statements and conclusions within the technical expertise of the authors?
- Does the abstract or executive summary describe the main points? Is it consistent with the discussion and conclusions?

Performing a Technical Review

This list of questions may be used to guide a technical review of MBMG publications. The list is adapted from an article by Barbara J. Kuyper, Bringing up scientists in the art of critiquing research: BioScience, v. 41, no. 4, 1 April 1991, p. 248–250, doi: https://doi.org/10.2307/1311414.

Introduction

1. Read the end of the introduction. Does it include a statement of purpose that clearly conveys the study objective?

2. Does the title state the subject of the paper precisely?

3. Read the statement of purpose in the abstract. Does it match that in the introduction?

4. Check the sequence of statements in the introduction. Does the information lead directly to the purpose of the study?

5. Are the statements and information presented in the background adequately referenced?

Methods

6. Review all methods in relation to the objective of the study. Are the methods valid for studying this problem?

7. Check the methods for essential information. Could the study be duplicated from the information given?

8. Review the methods for possible fatal flaws. Is the sample selection adequate? Is the experimental design appropriate? Have the authors acknowledged weaknesses, if there are any?

9. Check the sequence of statements in the methods. Does all information belong in the methods? Can the methods be subdivided for greater clarity?

Results

10. Examine the data presented in tables and illustrations. Do the captions and legends accurately describe content? Are column headings and labels accurate? Are the data organized for ready comparison and interpretation?

11. Review the results as presented in the text while referring to data in the tables and illustrations. Does the text complement, and not simply repeat, data? Are there discrepancies in results between text and tables?

12. Check all calculations and presentation of data.

13. Review the results in the light of the stated objective. Does the study reveal what the researcher intended?

Discussion

14. Check the interpretation against the results. Does the discussion merely repeat the results? Does the interpretation arise logically from the data, or is it too farfetched? Is uncertainty adequately characterized?

15. Have shortcomings or limitations of the research been addressed? Should there be a subsection in the discussion section that includes assumptions and/or limitations?

16. Compare the interpretation to related studies cited in the article. Is the interpretation at odds or in line with other researchers' thinking?

17. Consider the published research on this topic. Have other key studies been considered?

Conclusions

18. Do the conclusions add to the Discussion? One way to accomplish this, rather than simply re-stating portions of the Discussion, is to identify the relevance of the work to intended audiences.

19. Reflect on directions for future research. Has the author suggested further work, possibly based on assumptions or limitations identified in relation to this report?

Overview

20. Consider the publication series for which the manuscript is intended. Are the topic, format, vocabulary, and style appropriate for that series and for the intended audience?

21. Reread the abstract. Does it accurately summarize the manuscript? Does it highlight the information most likely of significance to the intended audience?

22. Check the structure of the manuscript (first headings and then paragraphing). Is all material organized under the appropriate heading? Are Sections subdivided logically into subsections or paragraphs? Do paragraphs have topic sentences?

23. Reflect on the author's thinking and writing style. Does the author present this work logically and clearly?

24. Are all of the data presented relevant to the overall objectives of the work? Is any of the information presented extraneous or distracting? Does any of the data presented belong in an appendix rather than the main body of the manuscript?

Writing a Technical Review

Technical reviews are submitted in various styles and formats. The example provided here, adapted from instructions written by editors at the journal Groundwater, is one that MBMG reviewers may find useful:

Review of "Title of Manuscript" by "First Author"

Optional: Reviewed by "Your name" (skip this if you would like to remain anonymous)

In the first paragraph of your review, briefly summarize the essential points presented in the paper. For example, state that the authors are presenting hydrogeologic data to characterize the groundwater/surface-water interactions in an intermontane valley in Gallatin County, Montana. Or, "The authors demonstrate that LiDAR data may be used to evaluate the presence of fault scarps." Offer your positive impressions of the work, such as that the paper is well-written and useful for the intended audience. Or, "This will be a major contribution to understanding water availability in the Jefferson River Valley." Rather than a critique of findings or interpretations, use this paragraph to demonstrate that you've read and understand the objectives of the work and to highlight positive aspects of the manuscript.

In the second paragraph, offer a summary of your evaluation. Focus on the technical credibility of the work, and support your opinion. For example, your opinion of the work ("The results presented do not support the conclusion that LiDAR successfully identifies faults for these reasons:…") should be supported by references to specific instances of weak or inconsistent arguments. Your opinion may call out the value of the manuscript ("The authors successfully showed through their LIDAR analysis that …"). Include your general assessment of the presentation in the manuscript:

- Is the report well organized, with a clearly defined objective or research goal?
- Is there adequate background information in the introduction?
- Are methods and results fully explained?

- Does the discussion include strengths and weaknesses of the work?

You can include statements about the writing (is it clear and logical, figures and tables are of good quality, etc.). State these findings in general terms, and leave specific details below this paragraph. End this paragraph with a clearly stated recommendation to the Editor. For instance, “I recommend that the report be published by the MBMG after slight revision to the text and extensive reformatting of figures.”

There are two easy ways to include your suggested revisions. The first is a line-by-line approach to draw attention to substantive and specific technical or organizational shortcomings. This will provide the necessary detail to illustrate what you observed in the second paragraph of this review. You do not need to provide a comprehensive proofread of the paper. Instead, if relevant, illustrate the problems (for example, inconsistent verb tense) in the writing with one or two specific examples and then state that similar shortcomings are found throughout the paper. This line-by-line review is best offered as an itemized list, something like the following.

> *Line 123: The statement that irrigation return is the primary source of groundwater recharge in southwest Montana will need some references.*
>
> *Line 322: It is not clear to me why the data collected with a recording pressure transducer were not corrected for barometric effects--please be more specific. A reference would be helpful.*

An alternative way to provide these specific comments is using the comment tool in Word or Adobe PDF. In the case that you would like your review to remain anonymous to the authors, keep in mind that making comments in Word or in a PDF may reveal your identity. You may be able to suppress this identification within the security settings in these software packages.

Here is an example of a technical review:

Review of “Field investigation of artificial recharge approaches for ASR projects in near-surface aquifers” by Smith et al.

This is a well-written paper that reports on a field test that compares the infiltration rate into a shallow unconsolidated aquifer from a seepage basin to the infiltration rate obtained via a direct push (DP) small-diameter well. The seepage basin was installed atop a fine-grained layer that restricted vertical flow to the water table. The DP well was screened below the aquitard, directing injected water into higher-K sediments. This alternative approach for aquifer storage and recovery projects is advantageous because of its low cost and the improved injection rate demonstrated by the field test, relative to that of a traditional infiltration basin.

I recommend that this paper be published following some revision by the authors. Their study describes a novel approach to injection techniques. The results are interesting, have potentially wide application, and are likely of interest to water system managers. The paper is well written and easy to follow. Data are clearly presented in the tables and figures. Importantly, the authors attribute the response to the presence of a fine-grained layer of sediment in the vadose zone at the field site. They state that such near-surface aquitards are common, and qualify their findings with a recommendation for evaluation in other hydrogeologic environments. Parts of the conclusions section reads like an advertisement for Geoprobe™; these should be re-written.

The following editorial and substantive comments are keyed to line and figure numbers:

Throughout text: consider use of “volumetric flow rate” rather than “flow rate” because the volumetric injection rate is the significant factor. For example, line 243: “recharge rate” is typically expressed as length/time.

Line 11: Abstract: acknowledge that while the DP well was gravity fed, the flow rate was limited by the head in the storage tank. The authors claim cost savings over other types of ASR but do not assess

the cost of elevated storage at the point of injection. An infiltration basin could receive water from a hose or pipeline at the ground surface, but the analysis presented on line 106 suggests this would not suffice for DP well injection.

Line 25-26 check grammar—water storage takes place underground but the capture of water does not.

Line 51-52 large diameter injection wells can be used for recharge and recovery. Can DP wells be used for recovery? Should list this as a limitation of DP wells.

Line 57 Same comment as abstract: the authors tout gravity recharge as a savings for infrastructure cost in use of DP wells, but neglect statement about improved performance with elevated storage relative to water table.

Line 98 LRR alluvial aquifer should be shown on the map in Fig 1 or clearly defined here. The alluvial aquifer is also referred to at lines 123-124

Figure 2 add a scale or label basin dimensions

Line 152 "most of that pore space was filled with water" This is speculation, not an observation. Suggest instead, "the reduction in infiltration rate is attributed to increased saturation of vadose zone sediment"

Line 160 Indicate on the time axis in figure 5 the start of the test compared to the water level rise. The text, "shortly after," is vague.

Line 190 Why was this test run for a shorter time period? Consider providing a table so the reader can easily compare the time, total volume and volumetric injection rates from both tests.

Line 192, 193 The text and Figure 6 refer to a DP well and an injection well. Clarify if this is one well with two names.

Figure 6 The line colors on the graph are difficult to distinguish; try varying patterns, weights or more contrast in colors.

Line 218 "showed a pattern" is vague. Do you mean the magnitude, timing, or both?

Line 301 Too many adjectives; consider changing "…clearly demonstrated the great potential for DP wells…" to "…demonstrate the potential for DP wells to provide injection where infiltration is limited by near-surface aquitards"

Responding to Reviews

As an author of MBMG publications, you will be asked to revise your work in light of technical reviews. As part of the process, you will need to provide written responses to reviews of your work. The goal of revising a document in light of reviews is to make the report, map, or publication better, both from a technical point of view and with respect to its clarity of communication.

Overall, your responses to review comments should indicate if you agree with the reviewer and have changed the manuscript in light of their comment. As the author, you may choose to disagree with a reviewer suggestion. If this is the case, briefly state why you believe the document is correct as written.

Here is an example of an author response to a technical review:

Parts of the conclusions section reads like an advertisement for Geoprobe™; these should be re-written.

Agree; conclusion rewritten

The following editorial and substantive comments are keyed to line and figure numbers:

Throughout text: consider use of "volumetric flow rate" rather than "flow rate" because the volumetric injection rate is the significant factor. For example, line 243: "recharge rate" is typically expressed as length/time.

Changed to volumetric flow rate throughout

Line 11: Abstract: acknowledge that while the DP well was gravity fed, the flow rate was limited by the head in the storage tank. The authors claim cost savings over other types of ASR but do not assess the cost of elevated storage at the point of injection. An infiltration basin could receive water from a hose or pipeline at the ground surface, but the analysis presented on line 106 suggests this would not suffice for DP well injection.

Comment added about elevation of storage tank in main text, line 58

Line 25-26 check grammar—water storage takes place underground but the capture of water does not.

Changed phrasing

Line 51-52 large diameter injection wells can be used for recharge and recovery. Can DP wells be used for recovery? Should list this as a limitation of DP wells.

Disagree. Groundwater can be pumped from DP wells. No change made.

Line 57 Same comment as abstract: the authors tout gravity recharge as a savings for infrastructure cost in use of DP wells, but neglect statement about improved performance with elevated storage relative to water table.

Comment added about elevation of storage tank in main text, line 58

Line 98 LRR alluvial aquifer should be shown on the map in Fig 1 or clearly defined here. The alluvial aquifer is also referred to at lines 123-124

LRR alluvial aquifer is shown on map; will change font to bold

Figure 2 add a scale or label basin dimensions

Figure 2 is a conceptual diagram and is not to scale. No change made.

Line 152 “most of that pore space was filled with water” This is speculation, not an observation. Suggest instead, “the reduction in infiltration rate is attributed to increased saturation of vadose zone sediment”

Used suggested wording

Line 160 Indicate on the time axis in figure 5 the start of the test compared to the water level rise. The text, “shortly after,” is vague.

Start of test added to axis

MANUSCRIPT PREPARATION FOR PUBLICATION

This section contains suggestions to assist you in preparing your document before you submit it for publication. This will usually be after formal review is completed, as reviewers and publications have different requirements (for example, a report will need line numbers and a TOC for review, but not publication). There may also be times when your document must be submitted to an external funding agency prior to MBMG publication; in those cases, the formatting requirements may differ from those described here.

Document Formatting

• Prepare documents submitted for publication in Microsoft Word, as double-spaced and unformatted text (please do not use styles--they will need to be stripped out, which may affect your text). Our standard fonts are Times New Roman for text and Arial for figures and captions, though these may vary by publication.

• **Include all graphics and tables as separate, original files, rather than embedding them within the text**. See the Graphics section for more detail on file types, sizes, etc.

• Prepare your tables using an electronic spreadsheet program (such as Excel) or Word's table editor, rather than using spaces and tabs. Save each table as a separate file.

• Use one space after periods rather than two. Word-processing programs automatically add a "thick space" after periods, so double spacing adds too many spaces that then must be stripped out.

• If you indent paragraphs, use a true indent that affects the entire paragraph, rather than using hard returns and tabbing each line.

• You do not need to generate a table of contents; for formal publications we will do this in the publication process. (If you created one for the review process, you can leave it in the file for the editor's reference.)

Documenting Sources

By accurately documenting sources you are adhering to established standards of professional ethics, enhancing the credibility and quality of your work, and ensuring that you avoid plagiarism. **Documentation is required for any direct quotation, paraphrase, or summary from someone else's work; opinions/conclusions that are not your own; statistical data that you did not compile; and any graphics that you did not create from scratch (photographs, tables, charts, illustrations).** The need to document sources applies to information in either print or electronic format.

Your in-text citations guide the reader to your list of references. The full reference citation in that list includes all the information that the reader needs to locate the source you consulted.

Citations and Quotations within Text

Citations within text contain the essential information a reader needs to find the complete reference for your source in the reference section. Citations within text must include the author's last name and date of publication; page number can also be included when quoting the source directly. If you are citing a single work of two authors, include both names; a work by more than two authors should be indicated with the primary author and the phrase "and others." Citation information that is not directly part of the sentence is enclosed in parentheses. Typical citations are shown in the following examples.

In a summary paragraph, he stated (Raymond, 1873, p. 281):...
…of the surrounding mountains (Lange and Zehner, 1992).
…and the Oregon Climate Service (Daly and others, 1994,1997; Daly and Taylor, 1998).
…10 to 12 mines were open (Tansley and others, 1933).
In the Ruby Range, James (1990a,b) described….

Enclose any direct quotations in your manuscript within quotation marks. If the quoted material runs longer than a single line, set it off as an indented paragraph enclosed within quotation marks. Use an ellipse (…) within quoted material to indicate that text has been omitted. Punctuation at the close of the quote is always placed inside the quotation mark.

He described geology as “one of the most essential, yet least understood factors.”

Personal communications are cited only within the text. Because personal information is considered unpublished and generally not available to the reader, it is not included in the reference section. Per STA, personal communications must be listed as either “written” or “oral” communications as below, with the year communicated.

…(P.C. Ryan, written commun., 1998)….

Reference Formats

STA Reference Style

A typical reference includes author’s last name and initials, date of publication, and title (separated by commas with a colon following the title). Information following the colon includes publisher information and document details (separated by commas, closed with a period). Capitalization is kept to a minimum (proper names, first letter of reference title, first letter after a dash). References are formatted using a hanging indent style. Because reference lists are now commonly included in databases, always include the author’s name for each reference (rather than dashes) when your list contains several references by the same author.

The STA contains in-depth information on preparing references, including a wide variety of sample references for printed sources. Two typical reference examples follow:

Bailey, R.W., 1961, Madison River–Hebgen Lake earthquake and highway problems, *in* Symposium on geology as applied to highway engineering, 12th Annual, 1961: Tennessee University, Engineering Experimental Station, Bulletin 24, p. 38–50.

Cruden, D.M., and Varnes, D.J., 1996, Landslide types and processes, *in* Turner, A.K., and Schuster, R.L.S., eds., Landslides—Investigation and mitigation: Transportation Research Board, National Research Council, Special Report 247, National Academy Press, 673 p.

MBMG style has no spaces between author initials. MBMG reports should be listed in the form “Montana Bureau of Mines and Geology Special Publication 116” or “Montana Bureau of Mines and Geology Open-File Report 530”. Note the capitalization and hyphenation for Open-File Report.

Documenting Electronic Sources

Documenting Internet sources follows the same basic approach as with a printed source, with one variation. Because electronic information sources are continually being updated and websites change rapidly, you need to include the full address to any Internet source and the date on which you accessed the website or database. A typical example follows:

> Daly, C., and Taylor, G., 1998, United States average monthly or annual precipitation, 1961–1990: Water and Climate center of the Natural Resources Conservation Service, Portland, Oregon: http:/www.ocs.orts.edu/prism/prism_new.html [Accessed 1/10/2010].

Here is the best way to reference a publication with a doi (digital object identifier):

> Dalrymple, R.W., Knight, R.J., and Lambiase, J.J., 1978, Bedforms and their hydraulic stability relationships in a tidal environment, Bay of Fundy, Canada: Nature, v. 275, p. 100–104, doi: https://doi.org/10.1111/j.1365-3091.1990.tb00624.x

Documenting Illustrations and Photographs; Using Copyrighted Material

Credit for illustrations (figures and photographs) created outside the MBMG **must** be included with the illustration or the accompanying caption. Any changes, notations, or modifications to illustrations should be clearly identified in the caption as "modified from."

You must obtain written permission from the copyright holder to use copyrighted material, even modified, in MBMG publications. A standard form letter has been developed for this type of request (available in this author's guide). The document also contains instructions on preparing your request letter, and the content of letter can be modified to meet the specifics of your request. A copy of the permission from the copyright holder must be included with the material you submit for publication. Email permissions are acceptable.

If you have been unable to secure all permissions before the document comes to Publications, or you are unsure what you need, the editor can assist you.

GRAPHICS PREPARATION

All graphics **must** be sent to Information Services as separate files, 300 dpi preferred. File types accepted: .tif, .eps, .pdf (editable), .ai, or .psd. **We cannot work with graphics created in Powerpoint or Word.**

Guidelines for Using Fonts on Maps

Use only two fonts, a serif and a sans-serif (usually Times New Roman and Arial). You can use regular, italic, or bold styles and size to distinguish between features on the map.

Examples (12 point):

Serif	Times New Roman
Serif-italic	*Times New Roman*
Serif-bold	**Times New Roman**
Sans-serif	Arial
Sans-serif-italic	*Arial*
Sans-serif-bold	**Arial**

MBMG Standards for Maps and Plates

A map is considered a document just like a book, not a poster, so sizes of graphics, charts, tables, etc. should reflect that. Font sizes should be the same as an 8.5 x 11-inch document. Best practices: 12 point for most text; 10 to 11 point for captions, tables, and graphics. 12 or 14 point bold for headings; 30 to 36 point for the title, 18 to 24 point for subtitles.

- Use standard sizes: 24 x 36; 30 x 36; 36 x 36; 36 x 42; 36 x 48; 42 x 42; 42 x 48, etc. Our plotter uses 36- and 42-inch paper.
- Each graphic on the map should be done in its own Illustrator file. This makes it easier to edit and you can make check-prints on regular letter or tabloid paper. Then you can put the whole thing together by inserting each component on its own layer.
- We have created templates for the most common sizes with already set layers, a neatline, title block and the text we usually use on the collar of a map. I also have templates for parts of a geology map. They are in: M:\Publications Public\USEFUL ITEMS\Graphics Help
- Use a neatline, 1-point, black, set 1 inch from the edges of the paper. We usually set a guide at 1.5 inches so text and graphics are not right up against the neatline.
- Our geology text is done with the font: FDGCGeoAge. A TTF version is in the map templates folder. ESRI fonts for symbols are okay.
- Figures should be numbered, not lettered.
- If you want Susan Smith to put the map together, she will need each graphic in its own file; tables and charts in Excel; text in Word; pictures as tiffs or jpegs at 300dpi or as high a quality as possible. Talk to Susan about exporting maps from ArcMap; there is an easy way to get them into Illustrator with layers and scale intact.
- Check with Susan if you have any questions: 406-496-4173 or ssmith@mtech.edu.

Geology

The following guidelines are from the Digital Cartographic Standard for Geologic Map Symbolization, p. 15, section 6.3.

Use sans-serif for most type such as unit labels, dip values, and fault names.

Use serif for labels on cross sections.

Sizes

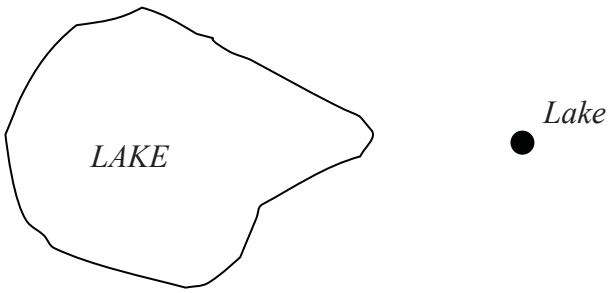
8 pt for most map unit labels, 6 pt in restricted areas
8 pt for names of faults and major structures, sample locality numbers and radiometric ages, and fault and contact ornamentation (U/D, A/T, Y/O)
6 pt italic for dip and plunge values
11 pt italic for cross section labels

For base map information, follow the styles found on a published topographic map sheet. The example that follows is taken from the Butte South 100K map.

Hydrologic features (rivers, lakes, springs, etc)	Serif-italic	*Jefferson River*
Natural features (gulches, mountains, ridges)	Sans-serif-italic	*Pandora Mtn*
Man-made features (mines, dams, etc.)	Sans-serif	Victoria Mine
Civil divisions/cities	Serif	SILVER BOW CO/Butte

No periods are used after abbreviations. Use all caps if lettering is within the unit and cap-lowercase if lettering is outside the unit.

Example:



Lettering

These general guidelines for lettering are an excerpt from The Preparation of Illustrations for Reports of the United States Geological Survey, p. 53–54.

Note: gothic = sans-serif type style; Roman or italic = serif type style.

The cultural features are named on maps by letters of two distinct styles—slanting gothic for public works and Roman for habitations and civil divisions. The size of the letters used should indicate in a general way the relative importance of the feature or group to which they are applied, but on some maps the county seats, State capitals, and large cities may be distinguished by different symbols. The names of civil divisions are lettered in sizes depending on their relative grade and the size of the area or space in which the names are to appear.

The features shown on a topographic map may be broadly separated into four groups and are lettered as follows:

• Civil divisions (countries, States, counties, townships, land grants, reservations, cities, towns, villages, settlements, schools, lodges, ranches, etc.), Roman capitals or capitals and lowercase.

• Public works (railroads, tunnels, roads, canals, ferries, bridges, fords, dams, mains, mines, forts, trails, etc.), slanting gothic capitals (light) or capitals and lowercase.

• Hydrographic features (oceans, seas, gulfs, bays, lakes, ponds, rivers, creeks, brooks, springs, wells, falls, rapids, marshes, glaciers, etc.), italic capitals or capitals and lowercase.

• Hypsographic features (mountains, ranges, peaks, plateaus, cliffs, buttes, canyons, valleys, peninsulas, islands, capes, etc.), upright gothic capitals (light) or capitals and lowercase.

The essential principles of lettering have been described in numerous treatises and are well understood by most drafters. The correct form of each letter may be learned from such treatises, but spacing and arrangement are best learned by observation and experience. Good lettering will not strongly attract attention, but even slight imperfections of form, spacing, slant, and shading will be quickly detected and criticized. Map letterers should note that the name of a place or the number of a symbol should be put to the right of the symbol, if possible, and a little above or below it—not to the left and directly on a line with it. Names indicating large areas, if written from west to east, should curve with the parallels, and all names should be so lettered that “if they should fall they would fall on their feet.” Every name should be distinctly legible but not so conspicuous as to subordinate the feature it designates. Lines should therefore not be broken in order to make the lettering clear except where there is possible danger that the smaller spaces may be filled up in printing. The lettering on a map should always be so spaced that it will properly fit the area it is intended to designate. In names consisting of two or more words the letters should not be closely spaced if wide spaces are left between the words. In numbers, except those used to indicate elevations on contour lines or elsewhere, thousands should always be set off by commas.

How to save ARCMAP figures so that fonts can be edited, text can be included in the figure, and legend text/elements can be re-sized if need be:

1. Do not have any transparencies (they can be set in Illustrator)
2. Save it as an AI file from layout format
3. Save any tiffs (hillshade, etc.) separately
4. Format: CMYK
5. Vectorize layers
6. Do not check any other boxes in the export window

For more details see the document “Exporting from GIS-v2.docx” in: M:\Publications Public\USEFUL ITEMS\Graphics Help

MBMG Standards for Page Size Diagrams/Charts

- Involve Susan Smith early in the process!
- Each graphic should be done in its own Illustrator file. This makes it easier to edit.
- Figures should be numbered, not lettered. Captions should be on a layer of their own for review only and all the captions should be given to Susan Barth in one Word file.
- Tables, graphs and cross sections should not be in boxes.
- Graphs can be imported from Excel to Illustrator, then can be edited (see below for details).
- Font sizes should be 12 point for most text; 10 to 11 point for captions, tables, and graphics. 12 or 14 point bold for headings.
- Use standard fonts, only 2–3 types per document. We generally use Arial and Times New Roman. Using different sizes, regular, bold, and italic versions of those two offers a lot of variety. Our geology text is done with the font: FDGCGeoAge. A TTF version is in the map templates folder in: M:\Publications Public\USEFUL ITEMS\Graphics Help. ESRI fonts for symbols are okay.
- For final publication Susan Barth will need each graphic in its own file without captions; tables and charts in Excel or pdf (or in Illustrator if they have been edited); text and captions in Word (unformatted); pictures as tiffs, jpegs, or pdfs at 300 dpi or as high quality as possible.
- Check with Susan Smith if you have any questions: 406-496-4173 or ssmith@mtech.edu.

EXCEL and X-Y Graphs

1) Chart Area

   a. No outline around the outer edge of chart

   b. Plot area is outlined on all four sides in black

   c. Major grid lines are optional.

      i. If used, make gray instead of black. Avoid dotted or dashed grid lines. Consider if they enhance the interpretation or clutter the image.

      ii. Grid lines are not as thick as axis lines

   d. Do not shade chart or plot areas

2) Axis Titles

   a. All figure axes are title case, which is capitalize each word except pronouns

   b. Arial font, size 10, non-bold

   c. X-axis can be rotated 45 or 90 to the left (if need be).

   d. Use major and minor tic marks on x and y axis

   e. Feet, meters, kilometers and miles are always abbreviated (ft, m, km, mi)

3) Dates

a. If denoting dates use text to denote months (not numbers) (fig. 1)

b. Space X-axis labels to provide a consistent reference, such as January 1 for each year, and the first of each month (i.e., if not specified, axis formatting in Excel may automatically assign dates that do not line up with the 1st of the month/year)

Example Below:

Note the tic marks coincide with the first of the month/year as possible and month is denoted as text.

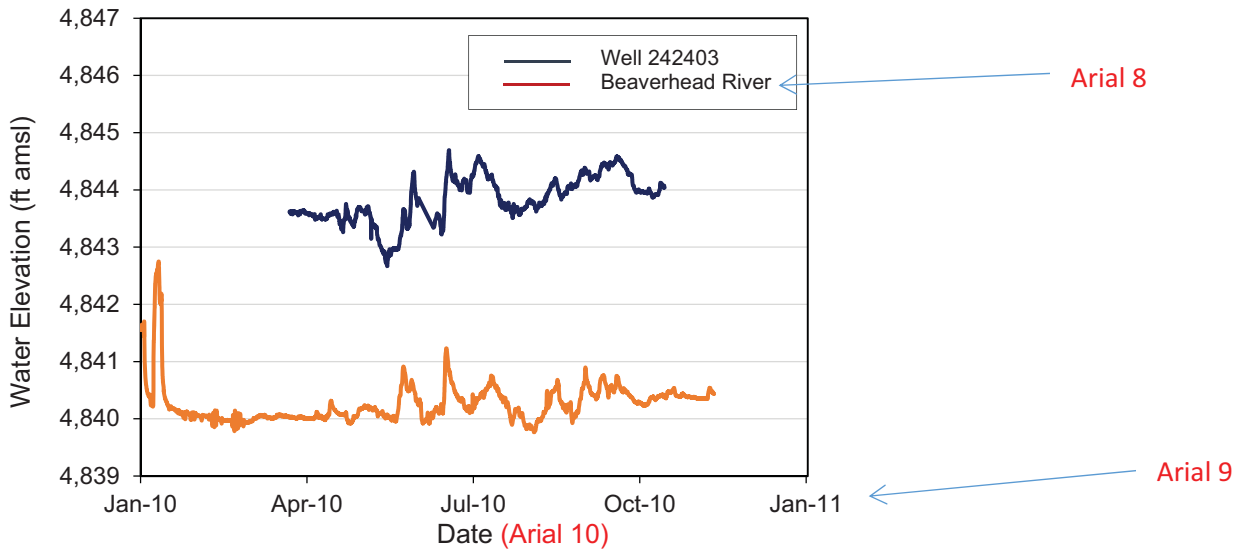


Figure 1. Groundwater and surface water have similar fluctuations. (Arial 11)

EFFECTIVE WRITING

Consistency

Consistency throughout your manuscript helps readers clearly understand the message you are conveying and prevents confusion or misunderstanding. Consistent use of punctuation, headings, figure labels, table elements, acronyms, abbreviations, and notations helps convey clarity, order, and logic in your document. Consistency plays a part in each of the individual topics covered in this section. From a practical standpoint it is also easier to correct a simple grammar or usage error if that error is consistent throughout the document.

Terminology

Although varying your word choice might be appropriate in an essay, the function of technical and scientific writing is to convey precise and accurate information. For example, if you are describing a "segment of a sample" in one passage, avoid calling it a "part of the sample" in a later passage. Similarly, hydrostratigraphic nomenclature should be established early on in a report and remain consistent throughout. For example, names of aquifers and aquitards, as well as subunits identified within an aquifer, need to be consistent (e.g., alluvial gravel and outwash sand). Also be sure to use common and current terminology, rather than inventing new, similar terms or falling back to terminology that has advanced since its use in the 1980s. Some standard forms for terminology and usage in MBMG documents are listed later in the Terminology List.

Punctuation

Apostrophes

An apostrophe is used to form possessives or indicate missing letters in contractions. Although plural forms of many words are created by adding -s or -es, an apostrophe is rarely used to form plurals.

…the agency (singular) …the agencies (plural) …the agency's (possessive)

Use an apostrophe and -s ('s) to form the possessive for most singular words:

…the valley's slope….

…the agency's policy

Use an apostrophe alone to form the possessive for plural words ending in with -s:

…the samples' characteristics

…the technicians' evaluations

Use an apostrophe to form contractions. Although contractions can add a more natural tone to business correspondence, it's (it is) best to omit them in technical and scientific writing:

…it is …it's

…who is …who's

Possessive pronouns can often be confused with contractions, but possessive pronouns are never formed with an apostrophe (its, hers, his, whose, theirs).

After examining the surface of the mineral sample, its crystalline structure was evaluated…

Not: After examining the surface of the mineral sample, it's crystalline structure was evaluated...

Tip: Ask yourself if you really mean to say….it is

Omit the apostrophe when referring to indefinite dates, such as:

…the late 1800s …early 1990s

Colons

A colon is used to separate introductory statements that are fulfilled by the statement that follows. It's helpful to think of colons as an equals sign (=); the two parts of the sentence on either side of the colon must be equal. Colons are commonly used this way to introduce either a list or a lengthy quote. The introductory statement preceding the colon should be capable of standing on its own.

Correct: The aggregate was composed of three rock types: type a, type b, and type c.

Incorrect: The aggregate was: type a, type b, and type c.

Colons can also separate the title of a reference work from the publication or publisher name, separate numerals representing hours from minutes, and follow the salutation in a business letter.

Alexander, R.G., 1955, Geology of the Whitehall area, Montana: Yellowstone-Bighorn

Research Project Contribution 195, 111 p.

…receipt of the core sample was logged at 11:53 a.m.

Dear Governor Billings:

Commas

Commas are the most frequently used punctuation mark; as a result, they are also the most misused. You can avoid problems by using commas only where necessary. Always use commas in the following situations.

After every item in a series of two or more, including the last item in the series:

…the number, size, and orientation of the openings…..

…the Silver Bell, St. Lawrence, and Cook mines….

Before conjunctions (and, but, or, nor, for, yet) linking two independent clauses:

The Lone Pine aquifer is the main source of water in the subarea, and it is used extensively for irrigation.

The Lone Pine aquifer is the main source of water in the subarea, but it is not used extensively for irrigation.

To set off titles, parenthetical phrases, or interrupters in the sentence:

…John Doe, Ph.D., addressed the meeting….

……the long-term water level declines, however, indicate lack of…

To separate date and year in dates, but not month and year:

The field studies began on April 20, 2006, and ended in July 2006.

On Thursday, April 20, the committee…

Dashes

Em dashes (—) set off nonrestrictive or parenthetical phrases from the rest of the sentence. Although paired commas or parentheses can serve the same purpose, em dashes typically call attention to the phrase being set off or signal an abrupt change in thought.

In the early 1800s, ore was shipped great distances for smelting—as far as Swansea, Wales.

En dashes (–) are used to indicate a range in numbers, for example a page range in a reference.

…Tennessee University, Engineering Experimental Station, Bulletin 24, p. 38–50.

En dashes are also used between two halves of a compound word that are equal in value:

spring–summer, east–west, copper–porphyry

Because they are similar in size, it is easy to confuse en dashes with hyphens. Dash symbols are inserted using the word processor insert menu or shortcut keys (Alt-151 for em dash; Alt-150 for en dash), and hyphens are typed from the keyboard. Two hyphens typed in succession can represent em dashes (some word processors automatically insert the symbol). **Spaces are not used before or after dashes or hyphens.**

Hyphenation

Hyphens can help clarify descriptive language and prevent misreading by linking words, parts of words, and certain terms. As with commas, a good rule of thumb is to use them only when necessary for clarity or as required by established style standards. Word processors have all but eliminated the need to be concerned with hyphens used to split words at the end of lines. The STA contains detailed guidance on hyphen usage, and some common situations that require hyphens are shown in the following examples.

When using words and terms as unit modifiers:

right-hand turn, 10-penny nail, half-baked idea

But never if the first word ends in –ly:

poorly defined contour, unusually wet field conditions

For spelling out fractions and compound numbers from twenty-one to ninety-nine:

two-thirds majority (but…a majority of two thirds), ninety-nine

With the prefixes ex-, self-, and all- and the suffix -elect:

self-tapping screw the ex-officio member the senator-elect

And to avoid confusing and awkward constructions:

co-worker (coworker) re-collect (recollect)

Note that MBMG style is to not hyphenate color descriptions such as "light gray" or "orangish red".

Semi-colons

Limit the use of semi-colons to those cases where they are required, as in the following examples. To separate items in a series when a comma is included in one or more elements:

The study included core samples from Gillette, Wyoming; Decker, Montana; and Fargo, North Dakota.

…ultimately mined the gravels of Alder Gulch (Jennings, 1916; Janin, 1918; Lyden, 1987).

To link two or more independent clauses without a coordinating conjunction:

The Lone Pine aquifer is the main source of water in the subarea; it is used extensively for irrigation.

The Lone Pine aquifer is the main source of water in the subarea; however, it is not used extensively for irrigation.

Verb–Subject Agreement

Singular subjects take singular verbs.

…the sapphire is clearly visible

Plural subjects take plural verbs.

…the sapphires are clearly visible

Compound subjects join with and take plural verbs.

…a garnet and a sapphire were discovered

…a garnet and some sapphires were discovered

Singular subjects joined with “or” take singular verbs.

…either a garnet or a sapphire is missing from the display.

For singular and plural subjects joined with “or,” the subject closest to the verb determines agreement.

…a sapphire or three garnets were discovered

…three garnets or a sapphire was discovered

Verb–subject agreement errors can occur because of intervening words between the subject and verb.

The analysis of the sampling tests has not been completed (analysis has, not tests have)

Collective nouns and pronouns can take either singular or plural verbs, depending on the context. If the collective is viewed as a unit, the verb should be singular; if the collective is viewed as separate items, the verb should be plural.

Acronyms

Because they interrupt the flow of text and can annoy readers, you should make an effort to minimize the use of acronyms. On the other hand, acronyms can be a useful shorthand technique in technical and scientific documents. When used, acronyms should be spelled out on first use in regular text followed by the shortened form enclosed in parentheses. Strive for consistency in your use of acronyms and avoid obscure or confusing acronyms, particularly if your intended audience includes the general public.

Familiar acronym: …the Federal Bureau of Investigation (FBI)

Obscure acronym: …the fluid bed incinerator (FBI)

A helpful acronym finder can be accessed using the following link: http://www.acronymfinder.com/

Abbreviations

Like acronyms, abbreviations are a handy shorthand notation common in technical material, particularly in graphs, charts, tables, figures, and maps. Abbreviations for units of measure used with numerals are appropriate (use 10 ft instead of 10 feet). Avoid using abbreviations alone within the text of your manuscript. Limit postal abbreviations for state names to addresses.

The diameter was measured in feet (not in ft). But: For this well, 10 ft of cable was used.

The aggregate consisted of sand and shale (not sand & shale)

See the STA, page 109, for a useful list of abbreviations. MBMG-specific tips can be found in the Terminology List.

Capitalization

Capital letters are used to identify the beginning of sentences, proper names, titles, and trade names. Follow standard usage for capitalization and strive to be consistent throughout your manuscript. Avoid using capitalization simply for emphasis.

In general, proper nouns that name specific persons, places, and things are capitalized, and common nouns that name general classes or categories of persons, places, and things are not capitalized.

Capitalize the first word in a sentence, proper names, specific places, and key words in titles.

The map was published by the U.S. Geological Survey and shows the northern Rocky Mountains…

…the Virginia City Vigilance Club…

Capitalize the first letter of formal geologic names.

...the Middle Cambrian Flathead Sandstone…

Capitalize both letters of state postal code abbreviations.

MT, not Mt.

Capitalize all words that are part of a proper geographic name, except articles and prepositions.

…Tobacco Root Batholith…

Craters of the Moon National Monument and Preserve

When you have a list of proper geographic names, capitalize the final noun:

Little Bear, Crazy, Bitterroot, and George Rivers

Capitalize all words in report headings and subheadings, except articles and prepositions.

Ground-Water Flow Systems

Intermediate and Deep Alluvial Aquifers

Table and figure titles follow the same style as sentences, with first word and proper nouns capitalized. Within the text, numbered figure and table references are not capitalized.

Figure 73. Fluoride and arsenic concentration…….

…as shown in figure 73….

Abbreviations and acronyms are usually capitalized in the same style as the words they represent.

Montana Bureau of Mines and Geology (MBMG)

Farenheit (F)

British thermal unit (Btu)

The exceptions to this general rule illustrate why it is best to consult a standard reference for correct usage.

kelvin (K)

hertz (H)

Lists

Vertical lists can help organize information and highlight key points that may be difficult to follow in paragraph form. Information set off in lists should be related logically and have the same grammatical structure. Parallel structure enhances the effectiveness of a list. List items should have similar construction (words, phrases, sentences) and grammatical form (verbs/verb phrases, nouns/noun phrases).

Introduce the list to put it in context for the reader and place a colon at the end of this introductory sentence if each item in the list completes the thought. Omit punctuation after list items unless the items are complete sentences or clauses. Generally, the first letter of each list item is capitalized.

Each field camp participant is required to have the following equipment:

- Binoculars
- Compass
- Rock hammer

Numbered lists are used only if the order or rank of the listed items is important, or if the items are referred to by number elsewhere, such as a figure or table.

Numbers

Use Arabic numerals rather than Roman numerals, except when they appear in a title or cited page reference.

Very generally, spell out numbers from zero to nine as words and express numbers 10 and above as numerals. When numbers from both groups appear in the same sentence or paragraph, they should be written the same way:

A team of three chemists and one engineer conducted the study. The firm employed 3 chemists, 1 engineer, and 12 technicians.

If a sentence must start with a number, spell out the numbers. Often these sentences can be recast.

Two hundred and eighty individuals attended the seminar. The seminar was attended by 280 individuals.

However, express units and measurements as numerals (dates, time, measure, money, degree, etc.).

…detected at concentrations greater than 1 mg/L…

…and this earthquake was first detected at 2:35 a.m. on July 5, 1956.

…median values less than 2.5 percent…

…built in Bannack in 1862 and 1863…

...the study took place over 10 yr...

For further details on how to handle numbers in text, see the STA.

Note this exception to the STA: the MBMG does not use an apostrophe when expressing a decade (the 1980s).

TERMINOLOGY/USAGE LIST

This terminology reference list contains usage and style guidelines specific to MBMG documents. These items either come up often during editorial review or are answers to frequently asked questions. This list will be revised and updated as usage and style questions arise.

MBMG Name

Whenever possible in text, refer to the Montana Bureau of Mines and Geology as "the MBMG" rather than "the Bureau." Define MBMG the first time it is used.

Tables/Figures

Use the following style when referencing tables and figures:

table X (table X)

figure X (fig. X)

When referring to a figure within the text, the wording should be "shown in" figure X, not ..."shown on" figure X.

Similarly, appendix is cited as lowercase in text (appendix A), as well as plate (plate 1).

Abbreviations

Use "in" as abbreviation for inch with numerals (8 in of subsoil, not 8 in. of subsoil) Use with period only when there is a possibility the abbreviation could be misread.

Hyphenation

Hyphenate the following when used as a modifier (so: water-quality report, but water quality)

open-file
CBM-produced water (but CBM production water)
saline-seep-affected
coalbed-methane levels
soft-water
cost-effective
water-quality
hard-water
water-well
land-use

Do not hyphenate (one word):

backfill
coalbed
crossbed
database
downgradient
downhole
floodplain
groundwater
landowner
offload
offsite
online
onsite
rainwater
setup (when used as a noun)
stockwater
timeline
upgradient
webpage
website

Do not hyphenate (two words)

cross section
surface water

Capitalization

State (when used as a stand-in for a specific state, for example: State agency) Federal (when used as a stand-in for U.S. government, for example: Federal agencies)

Names with a common generic term can be treated as a group in text or lists, but the generic term is still part of the name and must be capitalized:

...the Blackfoot, Little Blackfoot, and Clark Fork Rivers

...Madison and Gallatin Counties

Geologic Features:

Capitalize:

Hebgen Lake Fault
Lewis and Clark Line
Helena Valley Fault Zone
Shadow Lake Detachment Fault
Dillon Shear Zone
Madison Range Fault System
Grasshopper Thrust Plate
Lake Basin Lineament
Helena Salient
Tobacco Root Batholith
Philipsburg Pluton
Royal Stock
Sumatra Anticline
Ingomar Dome
Black Hills Uplift
Sweetgrass Arch
Belt Basin
Madison Valley
Bull Mountain Coal Field
Hog Heaven Volcanic Field
Yellowstone Caldera
Stillwater Complex
Anaconda Core Complex

Only capitalize first word (has to do with a "rule" in STA about belt and region) :

Fold-thrust belt

Disturbed belt

Yellowstone seismic region

Centennial seismic belt

Lists

Enclose list numerals in parentheses, but only when the list appears within text: The.....(1) first item, (2) second item, and (3) third item.

Table of Contents

No punctuation following figure and table titles.

Omit lengthy qualifying information from table and figure titles, to simplify.

Miscellaneous

Data are always plural. Datum is singular.

Exception to STA: use gauge rather than gage

NOTES ON WORD SELECTION

Our mission at the MBMG, to provide technical information, is distinct from agencies with a regulatory function. Some phrases, such as "adverse impacts" and "adverse effects," are inextricably linked to wording in water law and in many references to these laws. MBMG publications should typically not make use of these phrases in order to avoid any implication that our work is legally binding, and to avoid confusion about the scientific and objective nature of our work. Here's an example:

Confusing language: *The purpose of this project is to determine how much groundwater withdrawal is possible without adversely affecting groundwater and surface water.*

Clear language: *The purpose of this project is to evaluate potential effects of increasing groundwater withdrawals on groundwater and surface-water resources.*

Some words, such as "significant," have specific connotations in scientific writing. Significance describes a difference identified through a statistical test, so avoid this word unless you are referring to the result of a statistical evaluation. Here's an example:

Confusing language: *A significant reduction in irrigation may affect groundwater levels.*

Clear language: *A reduction in irrigation may affect groundwater levels.*

Including quantitative results to such statements adds specificity and strengthens the writing. Here's an example of such a conclusion:

Strong writing: *As demonstrated by model simulations, reducing irrigation by about 10 percent will likely cause a decline in groundwater levels on the order of 5 ft.*

Adjectives and adverbs, such as "very" or "significant," can often be left out of a sentence. Here's an example:

Vague: *The well is very close to the stream.*

Better: *The well is close to the stream.*

Best: *The well is about 5 ft from the stream.*

NOTES ON STYLE

Both the active and passive voices have a valuable role in technical writing. However, the passive voice should be used sparingly, because it is wordier and less definitive than an active expression. Repeated use of the passive voice leads to very dull reading material. As Strunk and White (1979) point out, the active voice "…makes for forcible writing." They continue on to advise that, "Many a tame sentence of description or exposition can be made lively and emphatic by substituting a transitive in the active voice for some such perfunctory expression as there is or could be heard." Here are some examples:

Passive: *There are two other discharges that flow into the Madison downstream of West Yellowstone.*

Active: *Two other discharges flow into the Madison downstream of West Yellowstone.*

Passive: Historically, agriculture has been dominant, and a portion of the valley is still irrigated.

Active: *Historically, agricultural land use dominated this area, and a portion of the valley remains irrigated.*

Passive: *It is also recommended that the Water Quality District continue monitoring the groundwater network and reinstate the surface-water network established for this project.*

Active: *Additional recommendations for the Water Quality District include continuing groundwater monitoring and reinstating the surface-water network established for this project.*

The below is taken from: http://www.mit.edu/course/21/21.guide/affect.htm, August 16, 2019

affect/effect/impact

Do not confuse the words affect, effect, and impact, each of which can be used both as a verb and as a noun. Avoid incorrectly using impact as a verb in place of affect or as a noun in place of effect.

1. *Affect* as a verb means "to influence"

   *The temperature **affects** the growth rate of the bacterial sample.*

   Affect as a noun has a specialized meaning in medicine and psychology, referring to moods and feeling as distinct from thoughts or knowledge. (It is not often used this way in geologic reports.)

   *Dua (1989) constructed the Thoughts and Real-Life Experience Scale (THARL) to assess the degree of positive and negative **affect** experienced by people as a result of their thoughts and day-to-day interactions.*

2. *Effect* as a verb means "to bring about, to produce," or to "accomplish something."

   *The temperature reversal **effected** a major slowdown in the bacterial growth rate.*

3. *Effect* as a noun means "result."

   *Increased bacterial growth rate was one major **effect** of the rise in pond temperature.*

4. *Impact* as a verb means "strike with a blow" or "to pack firmly together."

   *The wisdom tooth **impacted** the molar.*

5. *Impact* as a noun means "a collision."

   The constant **impact** *of the two gear mechanisms on each other eventually produced metal fatigue in several sprockets.*

6. Do not use *impact* as a verb in place of "to affect."

Weak

*The temperature **impacts** the growth rate of the bacterial sample.*

Improved

*The temperature **affects** the growth rate of the bacterial sample.*

7. Do not use *impact* as a noun in place of "effect."

Weak

*The release of hydrocarbons has had a significant **impact** on the depth of the ozone layer.*

Improved

*The release of hydrocarbons has had a significant **effect** on the depth of the ozone layer.*

USEFUL RESOURCES

Montana Geologic Names

Use the following link to view information on geologic names for Montana.
http://geoinfo.msl.mt.gov/Home/msdi/geographic_names/

National Geologic Names

The following link from USGS offers a search for geologic names across the U.S.
https://ngmdb.usgs.gov/Geolex/search

Writing and Style Publications

Suggestions to Authors of the Reports of the United States Geological Survey, 7th Ed.
Chicago Manual of Style
Franklin Covey Style Guide for Business and Technical Communication
The Science of Scientific Writing, George D. Gopen and Judith A. Swan
Words Into Type, Marjorie E. Skillin and Robert Malcolm Gay
The Elements of Style, Strunk and White
Geowriting: A Guide to Writing, Editing, and Printing in Earth Science, Robert L. Bates
Glossary of Geology, Robert L. Bates and Julia A. Jackson (copy in Susan Barth's office)
Glossary of Hydrology, William Edward Wilson and John E. Moore
Applied Hydrology, C.W. Fetter
Visual Explanations: Images and Quantities, Evidence and Narrative, Edward R. Tufte
Reporting Technical Information, Kenneth W. Houp and others
Line by Line : How to Edit Your Own Writing, Claire Kehrwald Cook

Montana Tech Library Website

Links to reference and citation information
http://www.mtech.edu/library/resources/reference.htm

PRESENTATIONS

Planning Presentations

We have created an MBMG presentation basic template for your use: Presentation Template.

Advance preparation is essential to successful professional presentations. One advantage of presentations over written communication is they offer the presenter the opportunity to adapt to and interact with the audience. Preparation and practice enable effective speakers to adapt to their audiences during a presentation.

Because audiences possess different levels of education and knowledge, keep a few questions in mind as you plan and prepare the presentation: How much do they know about the topic already? How much background material do I need to cover? Will they understand vocabulary/specific, topic-related terminology or jargon?

Effective presentations hinge on credibility (the audience's perception of a speaker) and competence (the speaker's expertise and abilities). You can enhance both aspects by sharing your credentials and experiences with the audience and by ensuring your supporting material is valid and high quality. Using strong organization will help you gather the most appropriate information and arrange key points strategically. Then you back up your key points with relevant, interesting, and accurate material to explain your ideas.

- Facts—present verifiable observation, experience
- Statistics—summarize and analyze numerical information
- Definitions—explain or clarify meaning
- Analogies—identify similarities, make the unfamiliar relevant
- Descriptions—create mental images
- Examples—make an abstract idea more concrete
- Stories/accounts/reports—Audiences often remember a good story, even when they can't remember much else about a presentation.

Use previews that introduce the information you will be covering and the order in which it will be covered. These summaries help reinforce important ideas and give you an opportunity to pause and repeat critical information before moving on. Strong transitions allow the audience to follow along as you move from one key point to another and from one section of a presentation to another.

Document your sources of supporting material "out loud" in your presentation and provide a written list of references as the last visual.

Some general tips for preparing your presentation:

- Resist the temptation to overuse graphics, fonts, colors, and visual elements. Simple is better.
- Make only one key point on each chart or slide.
- Use a title on each slide that states the key point.
- Ensure all information on the slide relates to that key point.
- Employ the 6 by 6 rule—no more than 6 lines of text per slide, no more than 6 words per line.
- Choose readable typefaces and suitable colors. Sans-serif fonts (Helvetica, Arial, Tahoma, Verdana) display better on screen than serif fonts (Times Roman).
- Use a consistent style and background throughout a presentation.
- Choose font and background colors with good contrast. Dark text on light background or light

text on dark background is preferable.

- Avoid red/green combinations. Some of your audience might not be able to see it.
- Avoid busy background images that interfere with text.
- Use type size suitable for projection and room size. Set up your visuals in advance and check readability from the back of the room, or place a printed slide on the floor and check to see if you can read it from a standing position.

Delivering Presentations

It's important to establish and maintain eye contact with your audience members. Eye contact allows you to establish a rapport and gauge audience reaction. During your presentation, make an effort to vary eye contact from side to side and front to back of the room. Don't fall into the trap of finding a friendly face and addressing only that single person. Some speakers find it easier to direct their gaze just over the heads of audience members.

You should strive to use natural gestures in conjunction with your presentation. Try to avoid repetitive movements such as tapping a lectern with a pencil, jingling change or keys in your pocket, or swaying back and forth. These actions can distract and even annoy members of the audience.

Presentation aids/visuals make your subject matter more interesting and easier to understand, clarify and reinforce ideas, and function as speaker notes. Because today's audience expects speakers to use presentation software (Microsoft PowerPoint or Apple Keynote), you need to skillfully use this technology to meet these expectations. You'll also need to be prepared so you can adapt if something goes wrong.

If at all possible, arrive early and practice your presentation in advance in the room in which it will be delivered. This gives you the opportunity to familiarize yourself with the lighting, equipment, and physical layout of the room.

Tips for delivering your presentation:

- Focus on your audience, not the visuals.
- Don't read from the projected screen.
- Do not just repeat what's on the slide. Let the audience read the slides for themselves, and elaborate on the points shown in your discussion. Use the slides as your speaker's notes.
- Don't turn your back on your audience. Stand to the side of the projection screen, face the audience, and point with the hand closest to screen.
- Display the slide long enough for an average reader to read it twice.
- Avoid long pauses between slides—keep talking as you advance.
- Don't display a slide after you've finished talking about it, and don't reveal a new visual until you are ready to talk about it.
- Stick to the time limit.

Handouts can help you explain difficult concepts and complex procedures, but they can also distract your audience. Providing handouts in advance of the presentation that contain space for the audience to take notes is one option. A second option is to make the handouts available at the conclusion of the presentation and announce this during your introduction.

EDITOR'S MARKS

The following list of handwritten editor's and proofreader's marks is taken from the Biomedical Editor website (http://www.biomedicaleditor.com/support-files/proofreadingmarks.pdf), but are common marks used most everywhere.

Marginal Mark	Textual Mark	Instruction
the/a	In first step, model	insert
ℓ	refer back to	delete
#	Genesplice	insert space
thin #	300 000	insert thin space
□	This analysis	insert 1-em space
⌣	EEG re cording	close up space
ℓ⌣	inoculate	delete + close up
sp	npo for 8 h	spell out
a	seperate study	substitute
tr	mean rate error	transpose
¶	the RNA. We found	new paragraph
run in	The following five criteria	no paragraph
⌐	Use of anti-inflam-matory	break line
[	[to find the	move left
]	to find the]	move right
⌐	The drugs have	move up
⌙	The drugs have	move down
][	]Chapter Title[	center
||	$P < .001$ $P < .05$	align vertically
caps	Medline	capitalize
lc	DNAse	lowercase
c + lc	journal article	capitalize + lowercase
sc	d-galactose	set small caps

Marginal Mark	Textual Mark	Instruction
ital	strains of E coli	set *italic*
bf	Discussion	set **boldface**
lf	given 5 mg daily	set lightface
rom	we *emphasize* that	set roman
v	3.27 × 10⁹	set superscript
2	$2H_2 + O_2 = 2H_2O$	insert subscript
wf	One participant had	wrong font
stet	and a double helix	stet (let it stand)
⊙	The study ended	insert period
^,	Moreover the data	insert comma
⊙:	on the following list	insert colon
^;	in all cases however,	insert semicolon
?	What is the dose	insert question mark
=	double blind study	insert hyphen
1/N	pp 300 / 305	set en dash
1/M //	the lowest, 1, 2, and 5 were added	set em dash
'	15 years experience	insert apostrophe
“/„	said that the side effects were minimal	insert quotation marks
≠/≠	tuberculosis TB	insert parentheses
[/]	(in tuberculosis TB)	insert brackets
minus	x^2 / y^2	set minus sign
equals	$x^2 - y^2 z^2$	insert equals sign
prime	The 5′ terminus	set prime sign

APPENDIX A: FORMS AND REFERENCE

Standard MBMG permission letter:

Montana Bureau of Mines and Geology

PERMISSION RELEASE

[Date]

Dear Content Owner:

We understand that you are the content holder of an image, [description of image or figure number], in "[Title of paper]," originally published in *[Title of publication and date]*.

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We appreciate your consideration of our permissions request.

Sincerely,

Susan Barth
Publications Editor, Montana Bureau of Mines and Geology
sbarth@mtech.edu

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Signature: _____

Date: _____

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