

Linear Sites

Guidance for Identifying and Recording under Section 106 of the National Historic Preservation Act

Endorsed for One Year Trial Use Utah Professional Archaeological Council

Last Updated 2008

I. Introduction

A. The following guidance on linear sites is provided and endorsed by the Utah Professional Archaeological Council (UPAC). The guidance is provided to assist agencies and consultants working in Utah with recording linear sites such as water conveyance systems (canals, pipelines, etc.), transportation systems (roads, trails, railroads, etc.), and connected pole systems (telephone, telegraph, electrical, fence lines, etc.).

B. Because decisions about appropriate identification, recording, and evaluation efforts are made by federal and state agencies in consultation with the State Historic Preservation Officer (SHPO) and other interested and consulting parties, neither UPAC nor any other party can dictate to an agency the appropriate methods for recording these or any other resources. However, UPAC provides the following advice and guidance that can be accepted by an agency (should they so choose) or used to help simplify discussions about these resources. It is possible, for example, for a consultant to ask an agency (or an agency to ask the SHPO) if they accept these guidelines and recommendations prior to undertaking a project. If the guidelines have been accepted, the consultant may then use the guidelines on project-by-project basis or when conducting work for the agency that has accepted the guidelines.

II. UPAC Recommended Approach

A. UPAC recommends that the best approach to identifying, evaluating, and determining effects for linear sites is as follows:

1. Follow the procedures established in the regulations at 36 C.F.R. 800 and consult prior to undertaking inventory efforts.
2. Make use of archival and historical data prior to, during, and after fieldwork to assist with determining potential problems and to determine proper recording and evaluation techniques.
3. Be flexible in the definition of the Area of Potential Effects (APE) in order to account for the likelihood that linear resources will extend beyond a project APE and that there may be indirect and cumulative effects on a linear resource.
4. Tailor the identification, recording, and evaluation techniques to the needs of the project and the involved agency(ies).
5. Remember to always conduct additional consultation if a situation is encountered that is not covered under this guidance or any other agreements.

B. Because there is considerable variation in linear resources and how undertakings/projects might

affect such resources, UPAC strongly recommends that the best approach to determining how to record linear resources is for the consultant to discuss the issue with the agency. UPAC recommends the agency follow the procedures in 36CFR800.3, 36CFR800.4(a), and 36CFR800.4(b) and consult with the SHPO as appropriate *prior to* beginning field identification efforts for a given project, preferably at the time the agency consults with the SHPO regarding the APE. The goal of this consultation will be to eliminate, as much as possible, the likelihood that recording linear resources would require an additional visit after the completion of fieldwork. To assist with addressing these questions and help shape the discussion, UPAC provides recommended best practices in the next section.

This consultation should bring in as much pre-fieldwork data as possible, which would ideally be provided by the consultant (such as the results of file searching, examining General Land Office Maps, examining other historical maps, aerial photos, and searching out other records (see D. below and suggestions in Appendix A) to discuss the following issues:

1. What is the Area of Potential Effects (APE) for the Project/Undertaking?
2. What types of linear resources are likely in the project area?
3. Does additional historical/archival research need to be conducted, and, if so, how much?
4. How are linear sites defined (and numbered) and how should they be recorded?
5. Based on the expected resources, the nature of the project, and potential project effects, what types of data will be needed on the portions of these resources in the project APE?
 - (a) Based on these needs, what type of inventory is needed to identify linear resources and what is the total inventory area within the APE for these resources?
6. How far out of the inventory area will a given resource need to be recorded in order to determine its characteristics, integrity, and eligibility to the National Register of Historic Places and to determine project effects?
7. What level of recording is appropriate for a given resource within and outside the inventory area?
8. How will resources that are part of a network (e.g. canals, roads, certain power and telegraph lines) be addressed? At what level will the overall network need to be recorded when it extends beyond the project APE?
9. How will artifacts and features associated with linear sites be recorded? What types of physically/spatially associated artifacts and features should be recorded as part of the linear site and what types should be recorded as separate sites?
10. What will be done during fieldwork when unexpected resources are identified?

C. The goal of any recording technique should be to provide the agency and the SHPO with sufficient information regarding a given linear site or feature so that they can determine:

1. The historical context, physical nature, and physical integrity of the feature within the APE.
2. The eligibility of the feature to the National Register of Historic Places.
3. The nature of the project effects (if any) on the feature.
4. Appropriate mitigation measures, if needed.

D. Advance research and historical background work prior to undertaking fieldwork is absolutely crucial and should be conducted for any project with even a minor possibility of encountering linear resources. Appendix A provides sources that should be reasonably checked. Unlike many other archaeological resources, linear resources are difficult to identify and evaluate based on physical characteristics in the field. Old roads may be faint and appear to be natural drainages; historically significant early canals may appear to only be small field ditches. Therefore, it is absolutely essential

to conduct advance research and then use that research to aid fieldwork. In ideal cases linear resources would not be “found” on survey, but rather “found” during background research and then “searched for” in the field. Even so, features identified in the field may suggest additional lines of background research that need to be pursued.

E. UPAC recommends that these, and other determinations, that affect the scope of the project be decided prior to letting contracts and/or requesting proposals from consultants that will be based on the scope. Alternatively, if this is not possible, UPAC recommends that the scope of work for a given project allow for an equitable process for changes in scope and compensation if this consultation is completed after a project is bid/awarded.

Best Practices

The following are best practices, not rules, and there may be good reasons to deviate from these practices. Indeed, if the nature of a project or an expected resource indicates that these practices in whole or part are either more than is needed or inadequate, consultation should be undertaken to jointly agree to changes from the practices. Ideally, and in many cases, a quick check with the agency (in the case of consultants) or SHPO (in the case of the agency) asking whether or not these practices are appropriate, should be sufficient.

A. Area of Potential Effects (APE)

1. The APE of an undertaking is determined by the agency in consultation with the SHPO.
 - (a) The APE does not necessarily have to correlate with any particular inventory area. It is possible to have an APE that is larger than the total inventory area, or to conduct different types of cultural resource identification efforts (survey, buildings survey, reconnaissance, etc.) within a single APE.
 - (b) The APE should be sufficient to take into account indirect (visual, auditory, etc.) and cumulative effects.
 - (c) Data collection outside the APE is not normally necessary, although recording of site portions outside a subset of the APE defined prior to fieldwork as the inventory area may very well be needed once fieldwork is underway. Such recording is not surveying or inventorying outside of the APE, but is rather collecting supplementary data to assist with understanding and evaluating resources in the APE.

B. Conducting Background Research

1. Background research is absolutely critical both prior to fieldwork and to assist with documenting, evaluating, and reporting linear resources.
2. In general, background research should minimally include searching the resources in Appendix A, Section I.
3. Research should be minimally sufficient to identify potential resources that may be present and to provide a context for each resource.
4. Additional research that could be considered in particular cases include the resources in Appendix A, Sections II and III.
 - (a) These should be considered depending on the nature of potential resources and the potential project effects. The more likely that a project area is to have a resource found in these secondary sources and the more likely the project is to affect these resources, the greater the need for searching these secondary resources.
5. The methods section of any reports should clearly state what sources were consulted and why, and if sources were unavailable or not useful the methods section should also state why sources were not utilized.

C. Site Definition and Numbering

1. Many site definition and numbering problems can be solved by conducting good background research and file searches prior to fieldwork. Such work should raise issues of how sites might or might not be defined and numbered prior to arriving in the field.
2. A linear site may be defined as any human-created feature or collection of features and artifacts

that is substantially longer than it is wide. It has physical expression in the form of remains or modifications to the landscape.

- (a) If historical research prior to fieldwork has identified that a particular linear site should be in a particular portion of the landscape, but no physical remains of the historical fabric of the linear site or associated artifacts/features can be identified on the ground within the survey area, the historic location of the site should be noted in the report but not recorded formally with a site form.
 - i. Example: Research strongly suggests that a historical trail is located beneath a modern highway, but no physical remains of the trail are present. The historical trail should be mentioned in the report, but does not need to be recorded formally. However, depending on the project, monitoring for traces of the historical fabric of the trail may be worthwhile.
 - ii. Example: A historical trail, retaining historical fabric, is present adjacent to a survey area but within the survey area it has been upgraded or replaced by modern construction (e.g. new pavement, etc.). The trail does not need to be recorded formally, but it should be noted in the report.
3. Linear sites with physical expression should be assigned Smithsonian numbers by county, and a reasonable effort should be made to reference to other Smithsonian numbers on each form should the site extend outside a single county.
4. The key issue for determining whether or not to assign separate numbers to expressions of a linear site/feature is degree of variability. If two expressions of a site share predominantly the same function, date of construction, purpose, etc. they can be grouped under a single number. If two expressions of a site differ in function, date of construction, purpose, etc. they should be recorded separately.
 - (a) Example: Multiple railroad main lines, constructed at different times and serving different purposes, could be assigned separate numbers within a county even if built by the same company and thereby having the same name.
 - (b) Example: Railroad spurs providing substantial access to communities or areas (e.g. long spurs serving mining communities) could be recorded as separate sites, but small spurs simply providing short or minor access to unimportant areas could be recorded as part of the main site.
 - (c) Example: Canal sub-branches constructed for the same purpose as the main canal and simply extending the canal into the intended area of use could be recorded as part of the main site, but secondary canals that opened up new areas for agriculture or served different purposes could be recorded separately.
5. Linear sites may cross or be superimposed over other sites, but they should be recorded separately and assigned separate site numbers. The key issue is whether the sites in question share a historical and/or functional association, not whether they are simply spatially associated.
 - (a) Example: A canal passing through a prehistoric site – the canal and the site should be recorded separately.
 - (b) Example: A road/canal/railroad passing through an unrelated historical site (e.g. a town, cemetery, etc.) - the linear feature and the unrelated site should be recorded separately. Further discussion regarding determining whether features are associated with linear sites is provided below.
 - (c) Example: If a 1920 highway is built on the existing grade of an 1875 railroad, the railroad and the highway should each be assigned separate site numbers and recorded separately.
6. If a given project records multiple disconnected segments of the same site only a single IMACS form should be produced. Segment numbers are not appended to site numbers. Rather, segment and feature numbers may be assigned and described on the IMACS form in Items C.14

and/or C.15, then cross referenced as appropriate to maps, photographs, etc.

7. Defining linear sites is a complex issue for which there are bound to be many individual instances. Consultation with the agency (in the case of consultants) or SHPO (in the case of agencies) is recommended for any case where these recommended practices don't appear to address the issue at hand.

D. Site Recording

1. **Recording and Eligibility** - The decision to record or not record a linear feature as a site is separate from whether or not a site is or may be eligible to the National Register of Historic Places. The decision is first made regarding how to record the feature and, then, if the feature is determined to be a site, the site is then evaluated with regard to eligibility to the National Register of Historic Places.
2. **Guidance on use of the IMACS form** – The IMACS form is not ideally suited for recording linear features. Examples of how best to use the form are provided in Appendix B.
3. **Importance of the Network** - When deciding whether or not to record a linear feature as a site, and when recording the site itself, a reasonable and good faith effort should be made to tie the feature to a broader network and , as will be discussed in greater detail below, to document the overall network.
 - (a) The overall network does NOT need to be identified/documentated via on the ground field efforts. Historical/map/other data, described in Appendix A, can and in most cases should be used to identify and document the overall network.
4. **Importance of Expectations from Background Research** - It is important to distinguish between what was expected and what was identified in the field. If background research (see Appendix A) has indicated that a linear site is expected, and a single pole, artifact pile associated with the expected resource, or very small portion is present, it should be recorded as a site. However, if an isolated pole or artifact collection is present and was not expected, it should be documented as an isolated feature.
5. **Recording as a Site or Isolated Feature** - Linear resources almost always merit recording on an IMACS site form. Suggested exceptions for specific resource types include:
 - (a) **Water conveyance features** - Short segments (pipelines, ditches) that cannot be clearly tied to larger networks or specific historical operations (e.g. dams/reservoirs, mills, etc.). These should be documented as isolated features.
 - i. Small, common, farm ditches that cannot be tied to larger networks should be recorded as isolated features unless they can be recorded as parts of associated, historical farms.
 - (b) **Telephone, telegraph, electrical, and fence lines** – Portions of these lines where too little of the alignment is present to determine the course of the line over the landscape. These should be documented as isolated features.
 - i. Generally if 2 or more poles or clear evidence of original line (e.g. wire bundles, insulators, utilized trees, etc.) are present, the resource should be recorded as a site.
 - ii. Fencelines not associated with other sites (e.g. not fencelines that are part of homesteads or road right-of-ways) should generally be recorded as isolated features. In very rare cases they are identified in historical background research (see Appendix A) as having formed significant early boundaries or historically significant landscape demarcations, or if they represent significant effort in design (e.g. gap fences) or construction (e.g. log fences or fences with incorporated stone wall segments). These rare instances can be considered for recording as sites.
 - (c) **Road segments** – The decision regarding whether to record a road segment as a site or isolated feature should be based on an overall consideration of three major criteria:

Historical Importance, Connection to Significant Areas, Investment in Original Design/Engineering/Construction.

- i. Historical Importance –
 - A. Prehistoric trails should always be recorded as sites.
 - B. Roads with well established historical significance (e.g. the Lincoln Highway, the Hastings Cutoff, a primary access route to a town, etc.) should be considered for recording as sites, even if only small segments with poor integrity are present. These sites are often called out in published histories for an area.
- ii. Connection to Significant Areas – If the segment provides an important tie to a major eligible (or potentially eligible) site or district it should be considered for recording as a site. If the segment simply connects other major transportation routes or is minor, it should be considered for recording as an isolated feature.
- iii. Investment in Original Design/Engineering/Construction – If substantial effort or time was expended in the design or construction of the road, it should be considered for recording as a site. If minimal to no effort was expended, and feature was simply created by following a given route (e.g. the ubiquitous 2-track), the feature should be considered for recording as an isolated feature.
 - A. Example: An older hand dug road may represent considerably more design effort than a larger informal road constructed with a couple of bulldozer passes. The former may qualify as a site and the latter as an isolated feature.
 - B. Example: An older highway switching back across a ridge with or without retaining walls may represent more design effort than a more recent highway that simply cuts through the ridge, given the technology changes through time. However, both may qualify as sites.
 - C. Example: A crowned unpaved highway crossing flat ground may represent more design effort than a flat bladed road of similar width crossing similar topography. The former may qualify as a site while the latter is less likely to do so.
- iv. Importance of single criterion – In most cases if a resource meets any of the above criteria, it is worth considering recording as a site. If it is not recorded, it should nonetheless be mentioned in the report. When in doubt, call the agency (in the case of consultants) or SHPO (in the case of agencies).
- v. Upgrading of original roads– Roads and railroads can and often are improved both historically and in modern times. The following guidance should be followed for recording improved roads:
 - A. If the historical fabric of an older road is completely obliterated or covered by non-historical upgrades (e.g. an old dirt road or trail has now been graded and/or paved), the historical road should be noted in the report but not recorded as a site or isolated feature.
 - Depending on the type of project, however, monitoring for traces of the original road may be a good idea.
 - Short segments of historical routes surviving after obliteration by newer roads (e.g. cuves) are common. The segments should be recorded as a site.
 - A scatter of artifacts relating to and following an otherwise obliterated route should also be considered for recording as a site.
 - B. Routes identified in archival research, namely the location of a historical road that may no longer be present, but where physical remains of the historical fabric of the road should be mentioned in the report but not recorded. However, if the route appears in the National Historic Trails listing, and its specific location is known, it should probably be considered strongly for recording, regardless of condition.

- (d) **Railroad segments** – Railroads can be considered in the same manner as roads, although most would qualify as sites. The decision regarding whether to record a railroad segment as a site or isolated feature should be based on an overall consideration of three major criteria: Historical Importance, Connection to Significant Areas, Investment in Original Design/Construction/Engineering.
- i. Age/Historical Importance –
 - A. Railroads with well established historical significance (e.g. the Transcontinental Railroad, the Denver and Rio Grande Western Railroad, etc.) should be considered for recording as sites, even if only small segments with poor integrity are present. These sites are often called out in published histories for an area.
 - ii. Connection to Significant Areas – Most railroad mainlines connect to significant areas by definition. Railroad spurs are less important. If a spur provides a connection to a major site (or industrial facility) it should probably be recorded as a separate site. If it is simply a short cutoff or extension or a connection to a minor factory or loading area, it should probably be recorded as a feature of the overall main railroad line/site. If its connection with a main line has been lost and cannot be determined it may merit recording as an isolated feature.
 - iii. Investment in Original Design/Construction/Engineering – Many railroads represent substantial effort in design, construction, or engineering, particularly if they cross slopes. Railroads must keep a gentle steady grade as they climb, and topography frequently presents significant obstacles that require substantial effort to cross. Certain grades or spurs on flat topography may not represent substantial effort, however. Such a feature may merit consideration for recording as an isolated feature or as a feature of the overall main railroad line/site.
 - iv. Importance of single criterion – In most case if a resource meets any of the above criteria, it is worth considering recording as a site. If it is not recorded, it should nonetheless be mentioned in the report. When in doubt, call the agency (in the case of consultants) or SHPO (in the case of agencies).
 - v. Upgrading of original railroads – Railroads are almost always upgraded both historically and in modern times, and the upgrades still keep the railroad very close to its original historical feeling and association. Therefore a modern grade/ballast/tracks over an historical grade should still be recorded as a site.
- (e) **Important Overall Note** - Background research (see Appendix A), conducted prior to fieldwork, should supplement observations in the field so that the decision regarding whether or not a resource merits formal recording as a site is based on both field observations and any available historical data (or lack thereof).
6. **Recording Beyond the Originally Defined Survey Area** - In general, a linear features encountered within a survey area that extends outside of the survey area should be field recorded to a maximum of 400 meters in each direction outside the survey area. The provision for extending the project APE mentioned above is the preferred regulatory mechanism for this effort.
- (a) The guideline of recording out to 400 meters can be lessened if sufficient information regarding the nature, integrity, and project effects on the feature has already been gained by the recording conducted in the survey area. For example:
 - i. If a substantial portion of the resource has already been recorded within the project survey area this information is often sufficient for evaluating the resource and its effects. In these cases, very little, potentially even none, of the site needs to be field recorded outside the survey area (but note Section D.5 below).
 - ii. However, if there are major differences of the resource outside the survey area (e.g.

- features, construction techniques, etc. that are not seen in the survey area) field recording may be necessary to enable a determination of eligibility and effects.
- iii. Aerial photographs, existing map data, etc. may often be used as documentation of the resource outside the survey area, particularly if these will provide all the necessary data for determining resource nature, integrity, and project effects.
 - iv. If access to the resource outside the project area is impossible (e.g. private land) or access cannot be safely obtained (e.g. steep slopes, other dangers, etc.) such information should be noted in the report and on the site form and a reasonable effort should be made to use other available data such as air photographs to document the feature outside the survey area.
- (b) In general, less detail is needed, even when field checking, for recording a resource outside the original planned survey area. However, it is important to provide photographs of the resource as it extends from the inventory area, estimations and reasonable map documentation of how far the feature is intact outside of the inventory area, and discussions/field documentation of any relevant features outside the inventory area which would influence a determination of site eligibility or project effects.
 - (c) Portions of the site that are recorded through other sources such as air photos or maps, but which are not field documented should be clearly distinguished on the site maps from portions that are field documented. These portions should be represented in master state or agency site databases differently from field checked segments.
 - (d) When a field person/crew is documenting a linear resource as it extends outside of an original survey area, they are documenting and not surveying. Therefore, if they happen to encounter another site (e.g. a prehistoric site, an unrelated historic site) during the documentation efforts, they do not have to record it fully as a site. It is recommended that they mention the site to the involved agency(ies), however, and the site may merit noting in the report.
 - (e) If a linear resource that is expected to cross a survey area is not encountered in the survey area, the researcher should make a reasonable effort to find physical remains outside the survey area. This effort should include searching based on expectations (e.g. intuitive searching) for what might be present. However, if no evidence of the resource is found in easily searched areas outside the survey area, no further documentation is needed. The effort and the results should be described in the report.
7. **Recording the Overall Network** – It is important to be able to convey the overall network in order to evaluate the significance of a given resource, portion of a resource, or determine project effects. However, it is not necessarily to completely field document the network or necessarily map every portion of the network using non-field (e.g. maps, air photo) sources. Rather, the goal is to provide the agency and SHPO with a clear understanding of the scale, nature, and scope of the overall network of which the documented segment is a part.
- (a) Generally, it is suggested that copies of maps (if found) showing the entire system be appended to the site form. Air photo data may also be used to help provide a view of the overall network. If no maps or air photographs are present, historical information from published histories may also provide an overview to the entire system.

E. Identifying/Recording Associated Artifacts/Features

1. **Determining Association of Artifacts/Features** - To determine if an artifact, artifact concentration, or feature is associated with and should be recorded as part of a particular linear resource, recorded as a separate site, or as an isolated feature/artifact the artifact(s)/feature(s) should be considered along two major continuums – Functional association and spatial

association while also considering whether or not the feature/artifact(s) represent substantial variability beyond that typical for the main part of the linear feature.

- (a) **Functional Association** – Features/artifacts that are clearly functionally associated with the linear feature (e.g. culverts on a road/railroad, headgates on a canal, right-of-way fence associated with a road or railroad, minor and redundant railroad trestles) should be recorded as features of the site in question, not as separate sites. Features/artifacts only incidentally spatially associated with the resource (e.g. equipment abandoned next to a road, unrelated signs next to canals) should be recorded as isolated features (or parts of other sites, if relevant).
 - (b) **Spatial Association** – To merit recording as part of a linear resource, the functionally associated artifacts/features should also be closely spatially associated with the main feature itself.
 - i. Trash is often disposed along roads and railroads. Isolated artifacts, or small assemblages of artifacts that would not otherwise merit recordation as a site and which are closely spatially associated with a road or railroad should be recorded as artifacts associated with the resource on the site form. At greater distances, where it is difficult or impossible to tell if they are associated with the road/railroad, they should merit separate recordation. See (c)(C) below, however, as large trash scatters that would otherwise merit recordation as a site, should be recorded separately.
 - (c) **Variability** - Features or artifact concentrations that show substantial variability beyond that represented by the majority of the main linear site, even if repeated elsewhere along the line should be recorded separately as sites, as appropriate. For example:
 - A. Dam and reservoir complexes linked to canals
 - B. Railroad section stations, terminals, construction camps, etc.
 - C. Large trash scatters
 - D. Gas stations
 - E. Rest areas
 - F. Substantial railroad trestles
 - G. Major bridges (These are typically recorded on Historic Sites Forms instead of IMACS forms. Check with the agency to verify).
2. **Level of detail in recording** - To determine the appropriate level of detail in recording associated features (e.g. headgates, culverts, etc.) it is important to have completed the advance consultation so that the level of detail can be geared to the nature of the project and the potential effects.
- (a) Enough information should be provided in the form of narrative, map location, and photographs that an agency can determine where the feature is relative to the overall feature, what the feature is, and what is the current condition of the feature.
 - i. Detailed measurements, however, are generally not necessary for an associated feature, unless they are necessary for distinguishing among features. What is needed is a good picture, a good location, supplemented with enough measurements to convey scale and whatever else is not seen clearly in pictures or is unique or key to the construction of the feature. In other words, it isn't generally necessary to measure every dimension of a culvert and associated wing walls, but it may be necessary to distinguish 12" diameter culverts from 36" diameter culverts.
 - ii. When multiple redundant features (e.g. culverts, small trestles) are present, it is generally sufficient to describe one and show the location of others.
 - iii. Tables and/or spreadsheets are often good mechanisms for documenting multiple associated features.
3. **Site Mapping** – Any feature that occupies a spatial extent of the site should be described and

depicted on a detail map, which is often needed in addition to a 1:24,000 map of the site. Feature numbers should be assigned, as appropriate, and used to cross reference descriptions, photographs, and map locations. Features that should be mapped in detail include swayles, roadbeds, fill prism limits (if unique features), cuts (if unique features), borrow ditches, borrow areas, culverts, bridges, agricultural ditches, headgates and turnouts, flumes, poles, pole stumps, artifact concentrations, etc. Consideration should be given to establishing site boundaries rather than mapping the site as a centerline (meaning mapping the site as a GPS polygon as opposed to a GPS line). If a site or segment is mapped as a centerline, the width should be relatively constant and it should be stated.

- i. Less detail in recording may well be appropriate. Consultation with the agency (in the case of consultants) or SHPO (in the case of agencies) is strongly recommended if recording these features appears to be in excess of the needs of the project.

F. Establishing Protocols for Unexpected Situations or Items not Covered in the Guidelines

1. Prior to the commencement of fieldwork, a communications protocol should be set up to assist a field director in making decisions when situations or resources arise that are not covered in these guidelines and were not covered in the pre-field consultation. This protocol should clearly identify:
 - (a) Who should be called
 - (b) At what number(s)
 - (c) How long the field director should wait for a response
2. The communications protocol should also:
 - (a) Define in advance whether given minimum recording levels (e.g. distance outside of survey area, level of detail) should be used in such situations or whether stricter standards may be merited.
 - i. It is recommended that a standard approach be that if unexpected or unknown resources are encountered, they be followed for a minimum of 400 meters outside the survey area in each direction with associated features and artifacts recorded at the same detail as those within the survey area.

APPENDIX A

Reasonable and Good Faith Sources of Data for Linear Sites and for Documenting Linear Site Networks

I. Minimal Sources of Data (i.e. easily accessible and should be utilized prior to, during, and after fieldwork)

- A) Archaeological and historical site files at the SHPO and each agency office.
- B) Google Earth (Aerial photos)
- C) General Land Office (GLO) Maps (<http://www.ut.blm.gov/wh3landrecords.html>)
- D) Earth Resources Data Center (Aerial photos, satellite/infrared images, etc.)
- E) Contemporary United States Geological Survey (USGS) Maps
- F) National Register of Historic Places (<http://www.nps.gov/history/nr/research/index.htm>)
- G) Published County Histories (e.g. *Utah Centennial History Suite*)
- H) Published Water Histories (e.g. *Report of Irrigation Investigations in Utah*, Mead, E., 1903)
- I) Published Power Histories (e.g. *Utah Power and Light Company: A History of Origin and Development*, 1941).

II. Important Secondary Sources of Data (i.e. these really should be consulted if at all possible, and definitely consulted if they would answer a crucial question)

- A) Historical USGS Maps (Repository libraries, agency working copies, etc.)
- B) Sanborn Fire Insurance Company Maps (<http://www.lib.utah.edu/digital/collections/sanborn/>)
- C) Historical Air Photos (Agency working copies, etc.)
- D) Land Patent Information
- E) AGRC Data
- F) Old County Highway Maps
- G) Utah Department of Transportation Highway As-built Maps

III. Sources of Data that Should be Considered when Relevant to a Question

- A) Online digital historic newspaper databases (can provide construction date information and occasionally maps)
- B) Military maps
- C) Railroad company maps
- D) GLO surveyor notes
- E) Department of Agriculture historical air photos (USDA Field Office at 2300S, 2222W, SLC has post 1953 photos, plans to put indexes online)
- F) Utility company maps
- G) Historical Air Photographs from the National Archives (searches are free, contractor charges for data; General no. 866-272-6272; Aerial photo contact Gerald Lutansky 301-837-1926; Mail geographic location of search area to National Archives at College Park, 8601 Adelphi Rd., College Park, Maryland, 20740, Attn NWCW-Rm 3320 in lower left corner of envelope)

- H) Direct oral interview information from irrigation network users or other living individuals
- I) Local historical societies, museums, etc.

APPENDIX B

Examples of IMACS Forms for Linear Sites

To be provided by Peter and Laird

APPENDIX C

Glossary of Terms

To be provided by Everett