



Land Use Procedures

Bulletin:

Large-Scale Pipelines *Historical Resources Act* Compliance

Purpose

This bulletin defines the *Historical Resources Act* (HRA) regulatory approval process for proposed large-scale pipeline projects in Alberta.¹ It applies equally in Alberta's white and green zones.

Definition

Pipeline projects can be composed of multiple development components including, but not limited to, the pipeline right-of-way, temporary workspaces (TWS), access roads, temporary accesses, staging areas and log decks. They may be associated with oil, natural gas, helium, water or other substances.

For the purpose of the process described in this bulletin, a pipeline will be considered to be a large-scale pipeline project if it meets one or more of the following conditions:

- has an index value [outside diameter (mm) x length (km)] of 2690 or greater²
- is composed of multiple segmented projects or spreads that, when considered together, have an index value [outside diameter (mm) x length (km)] of 2690 or greater²
- is subject to review under a provincial or federal environmental assessment process

When a pipeline project does not qualify as being a large-scale pipeline according to the characteristics listed above or has already proceeded to construction, the proponent must follow the standard regulatory approval process.³

All large-scale pipeline projects for which the HRA regulatory approval process is initiated as of April 1, 2024 must be reviewed by the Historic Resources Management Branch (HRMB) in accordance with the process outlined in this bulletin.

Process

The large-scale pipeline project management process includes four phases of development: (1) Project Initiation (Initial Historic Resources Application); (2) Pre-Construction Phase (HRA Project Requirements); (3) Construction Phase (Constraints Mapping Tool); and (4) Post-Construction Phase, as detailed below.⁴

¹ The process described in this bulletin applies to newly proposed, large-scale pipeline projects that are in the pre-construction phase. This bulletin does not apply to other linear development types, such as transmission lines, transportation highways/roads, or pipelines that do not possess one or more of the characteristics of large-scale pipelines defined above.

² For the purpose of the process described in this bulletin, this index applies throughout Alberta, to all qualifying large-scale pipelines in both the white and green zones.

³ The standard regulatory process for small-scale pipelines is detailed in [Small-scale Conventional Oil and Gas Development: Historical Resources Act Compliance](#). Staff of the Historic Resources Management Branch must be contacted in order to determine the appropriate course of action for major pipeline projects that are already part way through the HRA regulatory process or under construction.

⁴ The process workflow for large-scale pipeline projects is illustrated in Appendix D.

Project Initiation (Initial Historic Resources Application)

To initiate HRMB review of a large-scale pipeline project, a proponent is required to submit a Historic Resources (HR) Application that includes the best available development plans and GIS shapefiles of the **pipeline footprint**, as well as a Statement of Justification (SoJ) and an Archaeological Sensitivity Model of the **project footprint**.⁵ The sensitivity model must be prepared by a qualified archaeological consultant.⁶ The SoJ must be prepared in accordance with the instructions included in the [Historic Resources Statements of Justification form](#).

Application should not be made until a pipeline footprint has been developed and has a high likelihood of being constructed as depicted. If known, locations of ancillary components, such as temporary workspaces, laydown areas or access routes, are to be included in the initial submission. Due to the destructive nature of some historic resource investigations, requirements to conduct these investigations may not be issued if it is felt that the plans submitted are too preliminary or lack sufficient detail.

The SoJ and Archaeological Sensitivity Model must include an evaluation of a project footprint with a width of **no more than 90 metres**. This project footprint will include the proposed pipeline footprint plus a buffer of up to 30 metres in width on either side of the pipeline footprint.⁷ Ancillary components that extend outside the 90-metre project footprint are not to be buffered.

All sections of the SoJ form must be completed. This will include relevant information about archaeological sites, palaeontological sites, historic standing structures, and Indigenous traditional use sites of a historic resource nature that lie within the project footprint. This will help establish an understanding of the full suite of historic resources that may be of concern during a project's development.

Archaeological Sensitivity Model

The purpose of the Archaeological Sensitivity Model is to provide the context for understanding archaeological site potential within the project footprint. This model will inform project planning, will be used to help define any Historic Resources Impact Assessment (HRIA) requirements, will support the selection of field investigation Target Areas, and will provide the basis for the development of the project's Constraints Mapping Tool, which will be used to guide action during the construction phase.

The Archaeological Sensitivity Model must be developed by a qualified archaeological consultant on behalf of the proponent and must integrate existing environmental, geological, topographical and archaeological resource information into a model that supports the interpretation of the archaeological potential within the project footprint. The model must classify the project footprint in terms of areas of "high," "moderate" and "low" archaeological potential, ensuring that the rationale for the definitions of these categories are discussed in the SoJ.⁸

Pre-construction Phase (HRA Project Requirements)

Definition of Project HRA Requirements

Following review of the information submitted with the initial HR Application, the HRMB will issue a response that details the project's HRA requirements, conditions and/or approvals for all four types of historic resources: archaeological sites, historic structures and sites, palaeontological sites, and Indigenous traditional use sites of a historic resource nature.

⁵ See Appendix A for definitions of pipeline footprint vs. project footprint.

⁶ To obtain contact information for consultants qualified to undertake this work, please consult the list of [Alberta Historic Resource Consultants](#)

⁷ Project footprint area must include the pipeline footprint plus a buffer area of up to 30 metres on each side of the pipeline footprint. Buffer areas cannot exceed 30 metres in width, and the combined maximum width of pipeline footprint plus buffer must be no greater than 90 metres.

⁸ See Appendix B for Archaeological Sensitivity Model technical requirements.

Where conflicts between development impacts and historic resources are anticipated, an HRIA(s) will be necessary, but these requirements cannot be issued until a **sufficiently detailed project design** has been provided. This submission must include plans and shapefiles that depict the proponent's best definition of a pipeline footprint plus buffer and all known temporary accesses, TWS and other facilities. Together, the pipeline footprint plus buffer must not exceed 90 metres in width. Unbuffered shapefiles of the pipeline footprint also must be included.

HRIA requirements will be issued for the pipeline footprint only, but the proponent is encouraged to have a Historic Resources Baseline Assessment (HRBA) conducted for the buffer area.⁹ While HRMB review of the results of an HRIA(s) in a pipeline footprint ultimately will lead to HRA Approval or Approval with Conditions,¹⁰ the review of the HRBA results in the buffer area will inform the creation of a Constraints Mapping Tool used to manage any minor project alterations or additions that may occur in the buffer area. While HRBA studies are not mandatory for the buffer area, it is expected that a Constraints Mapping Tool developed through desktop assessment only will be considerably more restrictive than one that has been informed by field studies. Completion of an HRBA also reduces the chance of late-day HRIA requirements in the event of footprint changes within the buffer area.

In rare situations, where a pipeline footprint is situated entirely within lands considered to have low potential for historic resources, HRA Approval will be granted for the pipeline footprint, and a Constraints Map for the buffer area may be developed by a professional archaeologist based on desktop analysis.

For projects where plans with a reasonably well defined and detailed pipeline footprint are not yet available, HRA requirements will not be issued. If a proponent feels strongly that completion of historic resource field investigations will assist in their planning process, the HRMB may permit the proponent's consulting archaeologist to undertake an HRBA within a 90-metre corridor, focusing on the anticipated area of the pipeline footprint. Such HRBAs will not result in HRA approval but may yield information that can be incorporated into development of routing decisions, fill information gaps in the project's Archaeological Sensitivity Model, and/or help to inform future regulatory decisions.

Historic Resource Assessments

In Alberta, HRIA and HRBA studies for archaeological and palaeontological resources must be conducted by qualified specialists under approved investigation permits.¹¹ In general terms, the purposes of both the HRIA and HRBA are to identify potential conflicts that may occur between historic resource site locations and proposed project activities and to undertake any historic resources investigation to define ways to avoid, minimize or mitigate anticipated impacts to historic resources.

The results of both an HRIA and HRBA must be reported to the HRMB as part of the permit reporting obligations. For both assessment types, the reports must include a description of how the investigation results have supported or altered the understanding of archaeological site potential represented in the Archaeological Sensitivity Model. The Archaeological Sensitivity Model also must be updated using the HRIA and HRBA field data, and the updated model must be submitted as part of the permit reporting requirements in a mapped format, as GIS shapefiles, and as text discussion in the report.

All permit reports will be reviewed by the HRMB, and the results of this review will help define all further project HRA requirements or conditions of approval. The review will include evaluation of the updated Archaeological Sensitivity Model. The model may be subject to minor alterations as the result of the HRMB review. The revised model will form the basis of a Constraints Mapping Tool, issued by the HRMB, to be used for the evaluation of future minor alterations or additions within the project's defined buffer area.

⁹ For more information about the Historic Resources Baseline Assessment process, refer to the Archaeological Survey Information Bulletin [Historic Resources Baseline Assessments](#).

¹⁰ Approval to proceed with construction will be granted only after finalized, detailed development plans have been submitted.

¹¹ All permits are subject to the conditions of Section 30 of the HRA, the [Archaeological and Palaeontological Research Permit Regulation \(Alberta Regulation 254/200\)](#), all HRMB [Survey Notes and Bulletins](#), HRA requirement correspondence, and all special conditions applied to the permits.

Construction Phase (Constraints Mapping Tool)

For most large-scale pipeline projects, HRMB review of an HRIA report(s) will result in HRA Approval with Conditions. As long as well-defined project plans have been provided, this Approval with Conditions will allow construction to proceed, subject to a number of conditions that will guide the proponent's activities in relation to historic resources. Many of these conditions will be site-specific, defining actions that need to be taken during construction to minimize or avoid site impacts.

Once a large-scale pipeline project receives HRA Approval with Conditions to proceed with construction, needs may arise for minor route adjustments or additions to the pipeline footprint or to ancillary components, such as TWS, log decks, staging areas and temporary accesses. To manage historic resource issues in relation to minor dynamic changes that occur outside the pipeline footprint but within the project's buffer area, the HRMB will require the use of a Constraints Mapping Tool.

A Constraints Map will be developed by the archaeological consultant following the completion of the project HRIA and any HRBA studies. It must take the information developed during the preliminary Archaeological Sensitivity Modelling, refine it with the results of the field investigation(s) and create a model of "high" and "low" archaeological site potential in the project footprint.¹² The Constraints Map will be reviewed by the HRMB, and an approved version will be issued as the Constraints Mapping Tool.

Constraints Map Submission Requirements

The Constraints Map must be submitted by an archaeological consultant in a **stand-alone HR application that is not linked to a report submission and does not include footprint alterations that have not been reviewed previously**. This application must not be submitted until a final route has been determined and must include the following:

- a Constraints Map area map (PDF) that illustrates both the pipeline footprint and the "high" and "low" potential areas within the buffer area
- ESRI shapefiles or feature class files of the **buffer area only**, depicting the constraints areas
- a summary of all HRIA and HRMB investigations that were used to create the Constraints Map (indicating how they informed the creation of the tool)

In addition to materials listed above, the application must include detailed plans and project shapefiles illustrating the final footprint.

The HRMB will review the Constraints Map and supplementary information, modify if necessary, and issue the approved Constraints Mapping Tool for use in the management of the project's construction process.

The approved Constraints Mapping Tool must be used as a screening tool during the construction phase of the project.¹³ All new minor route adjustments and additions that occur during project construction must be evaluated using the Constraints Mapping Tool.

The Constraints Mapping Tool will define areas within the previously established buffer area as being of either "high" or "low" potential, with the following resulting actions:

- (1) **High site potential areas (Constraints Areas)** -- any minor proposed project alterations or additions that fall completely or partially within these areas, and cannot be redesigned to avoid these areas, must be submitted for review by the HRMB in an HR Application. Based on the results of the review, the proponent may be

¹² Applying the more comprehensive archaeological data obtained during the HRIA and HRBA studies, all areas previously identified as "moderate" potential will be translated into either "high" or "low" potential areas. If areas defined as "moderate" in the initial sensitivity model are not subject to either an HRIA or a HRBA, it is expected that they will become part of the "high" potential areas defined in the Constraints Map.

¹³ The approved Constraints Mapping Tool issued by the HRMB will include areas of high potential associated with all four types of historic resources.

required to undertake additional historic resources investigation before approval to proceed with construction is granted.

- (2) **Low site potential areas (Approval Areas)** -- any minor proposed project alterations or additions that fall completely within low potential areas will not require HRA Approval, and development may proceed as planned without further concern for historic resources. Details of these components will be provided to the HRMB in the final, as-built submission.

If a new project component, addition or route adjustment falls partly or entirely outside the boundary of the project footprint and Constraints Mapping Tool area, it must be submitted for review in an HR Application prior to the onset of land disturbance or construction activities. Footprints of changes submitted at this point in the process are not to be buffered. Following review of these HR Applications, the HRMB will issue further requirements, conditions or approval. HRA Approval must be granted before construction activities commence.

Minor project alterations or additions (as defined below) that require submission of an HR Application should be bundled into as few HR Applications as possible.¹⁴

Terms of Use of the Constraints Mapping Tool

In using the Constraints Mapping Tool to manage minor project alterations or additions, the proponent agrees to the following terms:

- Use of the Constraints Mapping Tool is limited to minor project alterations or additions (e.g., log decks, staging areas, temporary access roads, TWS) and minor route adjustments that fall within the buffer area surrounding the pipeline footprint. It is not intended for use for major pipeline re-routes or the addition of new facilities. **All large-scale additions or major footprint adjustments must be submitted in an HR Application for review by HRMB.**
- All Constraints Mapping Tools are project specific. The Constraints Mapping Tool created for a project is not transferable and cannot be used for any other development. If a developer finds themselves in need of information that will assist in project planning within the same region, they may refer to the Archaeological Sensitivity Map that was originally created for the project as a way of understanding areas of archaeological site potential within the general landscape. Use of the Archaeological Sensitivity Map in this manner, however, does not constitute a project HRA requirement or approval. All new projects must be submitted for review in an HR Application.
- HRMB will not consider the use of *The Listing of Historic Resources* for identifying constraints areas as a replacement for the Constraints Mapping Tool.
- The HRMB reserves the right to re-evaluate and re-issue a Constraints Mapping Tool should new historic resource information come to light during the use of the Constraints Mapping Tool.
- All minor project alterations or additions evaluated through use of the Constraints Mapping Tool must be tracked by project personnel and/or the archaeological consultant using spreadsheets, GIS shapefiles and legal survey/ownership plans. Following the completion of project construction, this record must be submitted as an as-built report that will be reviewed by the HRMB.

Post-construction Phase (As-Built Report)

At the completion of project construction, the proponent must submit an as-built report detailing all minor project alterations or additions that were evaluated using the Constraints Mapping Tool, including those that were located outside the constraints buffer area and required additional HRA Approval. The submission must include as-built plans of survey and GIS shapefiles of the final footprint, as well as a detailed spreadsheet, illustrations, and shapefiles of all minor project alterations or additions and a record of the actions taken by the proponent relative

¹⁴ To ensure all relevant information is carried forward, HR applications must be reviewed sequentially. As a result, submitting multiple applications for minor adjustments will cause greater delays than waiting for multiple changes to be compiled into a single submission.

to the HRA requirements or conditions for each minor project alteration or addition. GIS shapefiles submitted as part of this as-built package must contain an attribute field that identifies which of the additions or adjustments required no further review by HRMB, which were reviewed by HRMB under separate HR Applications, which minor project alterations or additions were subject to additional HRIAs, and the results of those HRIAs (see Appendix C for details). This submission must be in a stand-alone HR application not linked to the submission of an HRIA, HRBA or monitoring report.

Successful resolution of all HRA requirements and submission of the as-built plans must occur before a development activity can be released from all HRA conditions.

Special Considerations

1. The process described in this bulletin should not be initiated until the project footprint is reasonably certain. With each submission described above, the best-available development plans must be included.
2. For particularly complex projects, proponents and their historic resource consultants are encouraged to request a meeting with HRMB staff early in the project planning process, to define a project strategy and clarify HRMB expectations and timelines with respect to HR Application submissions, field investigations and reporting.
3. In situations where large-scale pipeline construction will occur simultaneously and independently for separate construction spreads, proponents and historic resource consultants may find it easier to expedite HRA approvals by treating each construction spread or phase as a separate project, with its own HRIA(s) conducted under a separate permit(s). To avoid complications that may result in review delays, proponents or their historic resource consultants must discuss project division with the HRMB before any HR Applications are submitted. Following this, the proponent and their consultants must ensure that each project phase, segment, or spread is **clearly delineated and that definition and naming of the phases, segments, or spreads is maintained throughout the duration of the HR Application and HRA field investigations and reporting processes.**
4. If substantial footprint changes are made to a large-scale pipeline footprint before or after the project has received HRA Approval or HRA Approval with Conditions, these project alterations, including all major re-routes and/or the addition of new facilities, must be submitted for review in a new HR Application prior to proceeding. Details must be provided in a **stand-alone application** submitted for the sole purpose of requesting review of the proposed changes. The application must not be linked to the submission of any HRIA or HRBA report. The application must include shapefiles and illustrations that depict the changes alone, plus shapefiles and illustrations that depict the entire pipeline footprint with changes incorporated.
5. Substantial footprints submitted before a Constraints Mapping Tool has been issued for the project are to include a buffer of up to 30 metres in width applied to reroute footprint, with a total width of not more than 90 metres. Since the buffer area is likely to be included in a future Constraints Mapping Tool, the submission must be accompanied by a sensitivity model and Statement of Justification, applicable to the reroute only.
6. A buffer area cannot be applied to substantial footprint changes that are submitted after a Constraints Mapping Tool has been issued for the project.
7. When circumstances dictate that horizontal directional drilling is required under waterbodies, roads, environmental protection areas or other landscape features that cannot be constructed through use of an open trench, HRA requirements will be the same as those issued for a project footprint that would be entirely open trenched. *Historical Resources Act* Approval for a project applies to all development components within the project footprint in perpetuity. As a result, consideration must be given to cumulative surface disturbances associated with commercial or recreational use of the right-of-way and emergency situations that may occur in the event of a pipeline spill or directional drill fail. For this reason, directional drilling is not accepted by the HRMB as an adequate long-term impact avoidance strategy.

Appendix A: Glossary of Terms

Archaeological Sensitivity Model

A model of the project footprint that depicts areas of high, moderate or low potential to contain archaeological resources. The model will be based on the best available environmental, geological, topographical and archaeological resource information and must be created spatially (shapefiles) and represented in illustrated map format.

Buffer Area

Refers to a buffer of up to 30 metres applied to each side of the pipeline footprint. Buffer areas cannot exceed 30 metres in width, and the combined maximum width of pipeline footprint plus buffer must be no greater than 90 metres.

Constraints Map

The Constraints Map of the buffer area is prepared by the consultant, based on the Archaeological Sensitivity Model, which will have been informed by the completion of the subsequent HRIA and any HRBA studies. The original “high” and “low” areas will have been refined, based on the results of field studies, and original “moderate” potential areas will have been defined as either “low” or “high.” The Constraints Map is submitted to the HRMB for review and forms the basis of the Constraints Mapping Tool.

Constraints Mapping Tool

The Constraints Mapping Tool is a screening tool used to guide construction-phase modifications within the buffer area. The Constraints Map submitted by the consultant is reviewed by the HRMB, adjustments are made if necessary, and an approved version is issued as the Constraints Mapping Tool. Small-scale adjustments planned for areas identified as “high” potential by the Constraints Mapping Tool require HRA approval in advance. Those planned for “low” potential areas may proceed without HRA approval.

Historic Resources Baseline Assessment (HRBA)

A site reconnaissance field program that is used to assess the overall historic resources site potential of a defined project area. It is conducted as an inventory and evaluation of archaeological resources sites that may exist within an area and generates information that can later be used for project planning. Unlike Historic Resources Impact Assessments (HRIAs), HRBAs do not result in *Historical Resources Act* Approval. They are conducted to provide preliminary planning information that can be incorporated into project management and development footprint design. All HRBAs must be conducted under an approved archaeological or palaeontological permit.

Historic Resources Impact Assessment (HRIA)

A program of historic resources field investigation designed to inventory and evaluate archaeological or palaeontological sites within a defined development footprint. The investigation may include reassessment of previously recorded archaeological and/or palaeontological sites or identification and assessment of newly identified sites. HRIAs include visual surface inspection, inspection of natural erosional exposures and subsurface testing (shovel testing and/or deep testing). All HRIAs must be conducted under an approved archaeological or palaeontological permit.

Listing of Historic Resources

The Listing of Historic Resources identifies lands in Alberta that contain or have a high potential to contain historic resources. The Listing is a tool that land owners, developers, industry representatives, and regulators may use to help determine if a proposed development might affect historic resources. The Listing is updated twice yearly and is publicly available at: <https://www.alberta.ca/listing-historic-resources.aspx>.

Pipeline Footprint

The footprint of the pipeline right-of-way plus known contiguous ancillary components, such as temporary workspaces, with no buffer area applied.

Project Footprint

Refers to the pipeline footprint plus applied buffer area.

Statement of Justification

[A document prepared by a professional archaeologist](#), in conjunction with other subject-area specialists, and submitted in an HR Application in order to obtain HRA requirements, conditions or approval for complex projects, projects that have been re-activated after a hiatus, or projects for which recommendations for or against historic resources fieldwork or site intervention are contrary to likely expectations and are justified by new or special information.

Appendix B: Archaeological Sensitivity Model Technical Requirements

In creating Archaeological Sensitivity Models, archaeological consultants must incorporate topographic and environmental variables and, integrating them with known locations of archaeological sites, classify areas as having “high,” “moderate” and “low” archaeological sensitivity.

Although the criteria, assumptions and methods underlying the strategy of creating an Archaeological Sensitivity Model may vary between the consultants developing the models, creation must include the evaluation of the following data:

- High resolution (LiDAR-derived¹⁵ where possible) terrain and topographic information
- Locations of known archaeological sites

Other data sets that should be employed include vegetation, water, slope, aspect, elevation, soils, geology or any other variable that may provide clues about the location of archaeological sites. Weighting and ranking of these variables and how they are combined to determine “high,” “moderate” and “low” archaeological potential areas is left to the discretion of the model creator, although Archaeological Sensitivity Models submitted for HRMB review will require a written description of the criteria and assumptions used to create the model in the accompanying Statement of Justification.¹⁶

Data presentation requirements of the Archaeological Sensitivity Model are as follows:

ARCHAEOLOGICAL SENSITIVITY MODEL

Data Provider:	Archaeological consultant
File Format:	ESRI shapefile or ESRI feature class
Geometry:	Polygon
Required Fields:	HR_Poten (text field, maximum 50 characters) (using only the variables <i>high</i> , <i>moderate</i> or <i>low</i>)
Topology:	<ul style="list-style-type: none"> • must be within the project footprint • polygons must be associated with only one HR_Poten variable • entire project footprint must be classified; no null values for polygons are permitted
Projection:	Alberta 10-TM Forest (EPSG:3400) ¹⁷

¹⁵ The proponent should make LiDAR imagery available to the consultant wherever possible to ensure that models are as accurate and well informed as possible.

¹⁶ In most cases, the classification of “moderate” within a sensitivity model will encompass those areas where there may not be enough desktop information to confidently assign a high or low potential classification.

¹⁷ The specific projection to be used is NAD_1983_10TM_AEP_Forest. Parameters are as follows: NAD_1983_10TM_AEP_Forest, WKID: 3400 Authority: EPSG, Projection: Transverse_Mercator, False_Easting: 500000.0, False_Northing: 0.0, Central_Meridian: -115.0,, Scale_Factor: 0.9992, Latitude_Of_Origin: 0.0, Linear Unit: Meter (1.0).

Appendix C: As-Built Reporting

Details

An As-Built submission is required for all projects managed through a Constraints Mapping Tool issued by HRMB. Reporting is completed through the submission of an HR Application. The application must include the following:

- a list of all developments initiated during the reporting period (Excel spreadsheet)
- as-built development plans that include all components in the list of developments
- ESRI shapefiles or feature class files (conforming to the spatial data requirements below)

Spatial Data Instructions

Shapefiles submitted as part of As-Built reporting must meet the following requirements:

- all Development Components included in the spatial data submission must be consistent with the Excel spreadsheet and development plan submissions and any other materials attached to the HR Application;
- spatial data must be submitted in ESRI shapefile or feature class format using Alberta 10-TM Forest (ESPG:3400);
- spatial data must have descriptive attribute tables. Attribute table(s) minimally must include the following information (although other fields desired by the proponent may be added):
 - Development component name (e.g., Temporary Workspace A)
 - Development component type (e.g., Pipeline or Access Road)
 - Submitted for HRA approval (Enter value Yes or No to indicate if each component was submitted for review in an HR Application.)
 - HR Application number (If Yes is reported in the *Submitted for HRA approval* field, provide the application number of the submitted application in the HR Application Number field [format HR #####])
 - HRIA conducted (Enter value Yes or No to indicate if each component was subjected to one of more HRIAs)
 - HRIA outcome (Enter value Approval or Conditions to indicate the regulatory outcome of the HRIAs of each component)

Appendix D: Large-Scale Pipeline Process Workflow

