MSU Trusted Digital Repository: TRAC Checklist Section A

Metric	Example Evidence	Response	Documentation	Notes
3 Organizational Infrastructure				
3.1 Governance & organizational viability				
3.1.1 The repository shall have a mission statement that reflects a commitment to the preservation of, long-term retention of, management of, and access to digital information.	Mission statement or charter of the repository or its parent organization that specifially addresses or implicitly calls for the preservation of information and/or other resources under its purview; a legal, statutory, or government regulatory mandate applicable to the repository that specifically addresses or implictly requires the preservation, retention, management and access to information and/or other resources under its purview.	Complete	Repository policy documentation UAHC mission statement	Mission statement of UAHC: http://www.archives.msu.edu/about/mission.php?about_missionIn development
3.1.2 The repository shall have a Preservation Strategic Plan that defines the approach the repository will take in the long-term support of its mission.	Preservation Strategic Plan; meeting minutes; documentation of administrative decisions which have been made.	Complete	Repository policy documentation	Digital Preservation Strategies section
3.1.2.1 The repository shall have an appropriate succession plan, contingency plans, and/or escrow arrangements in place in case the repository ceases to operate or the governing or funding institution substantially changes its scope.	Written and credible succession plan(s); explicit and specific statement documenting the intent to ensure continuity of the repository, and the steps taken and to be taken to ensure continuity; escrow of critical code, software, and metadata sufficient to enable reconstitution of the repository and its content in the event of repository failure; escrow and/or reserve funds set aside for contingencies; explicit agreements with successor organizations documenting the measures to be taken to ensure the complete and formal transfer of responsibility for the repository's digital content and related assets, and granting the requisite rights necssary to ensure continutiy of the content and repository services.	Incomplete		Succession planning will be included in a future phase of the repository.
3.1.2.2 The repository shall monitor its organizational environment to determine when to execute its succession plan, contingency plans, and/or escow arrangements.	Administrative policies, procedures, protocols, requirements; budgets and financial analysis documents; fiscal calendars; business plan(s); any evidence of active monitoring and preparedness.	Incomplete		Succession planning will be included in a future phase of the repository.
3.1.3 The repository shall have a Collection Policy or other document that specifies the type of information it will preserve, retain, manage, and provide access to.	Collection policy and supporting documents; Preservation Policy, mission, goals and vision of the repository.	Complete	UAHC Collecting Policy	UAHC Collecting Policy http://www.archives.msu.edu/about/collectingPolicy.php?about_collecting
3.2 Organizational structure & staffing				
3.2.1 The repository shall have identified and established the duties that it needs to perform and shall have appointed staff with adequate skills and experience to fulfill these duties.			See below	
3.2.1.1 The repository shall have identified and established the duties that it needs to perform.	A staffing plan; competency definitions; job description; staff professional development plans; certificates of training and accreditation; plus evidence that the repository reviews and maintains these documents as requirements evolve.	Complete	Organizational Chart Responsibility Matrix	MSU IT Services, including Content and Collaboration division and University Archives unit

3.2.1.2 The repository shall have the appropriate number of staff to support all functions and services.	Organizational charts; definitions of roles and responsibilities; comparison of staffing levels to industry benchmarks and standards.	Complete	Organizational Chart Responsibility Matrix	MSU IT Services, including Content and Collaboration division and University Archives unit
3.2.1.3 The repository shall have in place an active professional development program that provides staff with skills and expertise development opportunities.	Professional development plans and reports; training requirements and training budgets, documentation of training expenditures (amount per staff); performance goals and documentation of staff assignments and achievements, copies of certificates awarded.	Complete	Staff Evaluations	Professional development goals are part of the annual review process. Progressive professional development is required as part of the tenure process.
3.3. Procedural accountability & policy framework				
3.3.1 The repository shall have defined its Designated Community and associated knowledge base(s) and shall have these definitions appropriately accessible.	A written definition of the Designated Community.	Complete	Repository policy documentation UAHC mission statement	Mission statement of UAHC: http://www.archives.msu.edu/about/mission.php?about_missionIn development
3.3.2 The repository shall have Preservation Policies in place to ensure its Preservation Strategic Plan will be met.	Preservation Policies; Repository Mission Statement.	Complete	Repository policy documentation	
3.3.2.1 The repository shall have mechanisms for review, update, and ongoing development of its Preservation Policies as the repository grows and as technology and community practice evolve.	Current and past written documentation in the form of Preservation Policies, Preservation Strategic Plans and Preservation Implementation Plans, procedures, protocols, and workflows; specifications of review cycles for documentation; documentation detailing reviews, surveys, and feedback. If documentation is embedded in system logic, functionality should demonstrate the implementation of policies and procedures.	Complete	Repository policy documentation on Confluence wiki	Marking this one complete with reservations. We have an internal mechanism for updating policies (Confluence wiki). But we don't have a plan for when we will be reviewing/ updating them and exporting them to a public site. We could add a page to the Confluence site about this, with 3.3.6.
3.3.3 The repository shall have a documented history of the changes to its operations, procedures, software, and hardware.	Capital equipment inventories; documentation of the acquisiton, implementaiton, update, and retirement of critical repository software and hardware; file retention and disposal scheules and policies, copies of earlier versions of policies and procedures; minutes of meetings.	Complete	Hardware/Software Inventories	Maintained by IT Services
3.3.4 The repository shall commit to transparency and accountability in all actions supporting the operation and management of the repository that affect the preservation of digital content over time.	Reports of financial and technical audits and certifications; disclosure of governance documents, independent program reviews, and contracts and agreements with providers of funding and critical services.	Complete	Fiscal Officer Audits	
3.3.5 The repository shall define, collect, track, and appropriately provide its information integrity measurements.	Written definition or specification of the repository's integrity measures (for example, computed checksum or hash value); documentation of the procedures and mechanisms for monitoring integrity measurements and for responding to results of integrity measurements that indicate digital content is at risk; an audit process for collecting, tracking, and presenting integrity measurements; Preservation Policy and workflow documentation.	Complete	Repository policy documentation Repository technical documentation	Java Programs Used in the Spartan Archive System https://confluence.itservices.msu.edu/display/ContColl1/Java+programs+used+in+the+Spartan+Archive+System Utility Programs➔ ValidateFedoraFiles
3.3.6 The repository shall commit to a regular schedule of self-assessment and external certification.	Completed, dated checklists from self-assessment or third-party audits; certificates awarded for compliance with relevant ISO standards; timetables and evidence of adequate budget allocation for future certification.	Incomplete	TRAC checklist	Need to commit to a self-assessment schedule. Might be able to add a Confluence page abou this, with 3.3.2.1.

3.4. Financial sustainability				
3.4.1 The repository shall have short- and long-term business planning processes in place to sustain the repository over time.	Up-to-date, multi-year strategic, operating, and/or business plans; audited annual financial statements;financial forecasts with multiple budget scenarios; contingency plans; market analysis.	Complete	Strategic goals Projects List	Strategic goals are reviewed every 1-3 years, with the projects list reviewed annually.
3.4.2 The repository shall have financial practices and procedures which are transparent, compliant with relevant accounting standards and practices, and audited by third parties in accordance with territorial legal requirements.	Demonstrated dissemination requirements for business planning and practices; citations to and/or examples of accounting and audit requirements, standards, and practice; audited annual financial statements.	Complete	Fiscal Officer Audits	The fiscal officer is responsible for reviewing all financial transactions for compliance with MSU business procedures.
3.4.3 The repository shall have an ongoing commitment to analyze and report on financial risk, benefit, investment, and expenditure (including assets, licenses, and liabilities).	Risk management documents that identify perceived and potential threats and planned or implemented responses (a risk register); technology infrastructure investment planning documents; cost/ benefit analyses; financial investment documents and portfolios; requirements for and examples of licenses, contracts, and asset management; evidence of revision based on risk.	Incomplete		Need for business/financial risk analysis and management is known, and will follow operational risk analysis in a future phase of the repository.
3.5. Contracts, licenses, & liabilities				
3.5.1 The repository shall have and maintain appropriate contracts or deposit agreements for digital materials that it manages, preserves, and/or to which it provides access.	Properly signed and executed deposit agreements and licenses in accordane with local, national, and international laws and regulations; policies on third-party deposit arrangements; definitions of service levels and permitted uses; repository policies on the treatment of 'orphan works' and copyright dispute resolution; reports of independent risk assessments of these policies; procedures for regularly reviewing and maintaining agreements, contracts, and licenses.	Complete	Repository policy documentation Submission agreements Transmittal forms Deeds of gift	
3.5.1.1 The repository shall have contracts or deposit agreements which specify and transfer all necessary preservation rights, and those rights transferred must be documented.	Contracts, deposit agreements; specification(s) of rights transferred for different types of digital content (if applicable); policy statements on requisite preservation rights.	Complete	Repository policy documentation Submission agreements Transmittal forms Deeds of gift	
3.5.1.2 The repository shall have specified all appropriate aspects of acquisition, maintenance, access, and withdrawal in written agreements with depositors and other relevant parties.	Properly executed submission agreements, deposit agreements, and deeds of gift; written standard operating procedures.	Complete	Repository policy documentation Submission agreements Transmittal forms Deeds of gift	
3.5.1.3 The repository shall have written policies that indicate when it accepts preservation responsibility for contents of each set of submitted data objeccts.	Properly executed submission agreements, deposit agreements, and deeds of gift; confirmation receipt sent back to producer/depositor.	Complete	Submission agreements Transmittal forms Deeds of gift	
3.5.1.4 The repository shall have policies in place to address liability and challenges to ownership/rights.	A definition of rights, licenses, and permissions to be obtained from producers and contributors of digital content; citations to relevant laws and regulations; policy on responding to challenges; documented track record for responding to challenges in ways that do not inhibit preservation; examples of legal advice sought and received.	Complete	Repository policy documentation	

3.5.2 The repository shall track and manage intellectual property rights and restrictions on use of repository content as required by deposit agreement, contract, or license.	A Preservation Policy statement that defines and specifies the repository's requirements and process for managing intellectual property rights; depositor agreements; samples of agreements and other documents that specify and address intellectual property rights; documentation of mointoring by repository over time of changes in status and ownership of intellectual property in digital content held by the respository; results from monitoring metadata that captures rights information.	Complete	Preservation policies Submission agreements Transmittal forms Deeds of gift	

MSU Trusted Digital Repository: TRAC Checklist Section B

Metric	Example Evidence	Response	Documentation	Notes
4 Digital Object Management				**BLUE**: Greater Trusted Digital Repository (TDR) **GREEN**: NHPRC Spartan Archive Project **BLACK**: Applies to both
4.1 Ingest: acquisition of content				
4.1.1 The repository shall identify the Content Information and the Information Properties that the repository will preserve.	Mission statement; submission agreements/deposit agreements/deeds of gift; workflow and Preservation Policy documents, including written definition of properties as agreed in the deposit agreement/deed of gift; written processing procedures; documentation of properties to be preserved.	Complete	Repository policy documentation Submission agreements Transmittal forms Deeds of gift	Need to formalize submission agreement with RO
4.1.1.1 The repository shall have a procedure(s) for identifying those Information Properties that it will preserve.	Definitions of the Information Properties which should be preserved; submission agreements/deposit agreements, Preservation Policies, written processing procedures, workflow documentation.	Complete	Repository policy documentation Submission agreements Transmittal forms Deeds of gift	Processing procedures and workflow documentation in repository policy documentation
4.1.1.2 The repository shall have a record of the Content Information and the Information Properties that it will preserve.	Preservation Policies, processing manuals, collection inventories or surveys, logs of Content Information types, acquired preservation strategies, and action plans.	Complete	Repository policy documentation Spartan Archive Data Definitions	Links to Spartan Archive data dictionaries included in repository policy documentation.
4.1.2 The repository shall clearly specify the information that needs to be associated with specific Content Informationn at the time of its deposit.	Transfer requirements; producer-archive agreements; workflow plans to produce the AIP.	Complete	Repository policy documentation Submission agreements Transmittal forms Deeds of gift	
4.1.3 The repository shall have adequate specifications enabling recognition and parsing of the SIPs.	Packaging Information for the SIPs; Representation Information for the SIP Content Data, including documented file format specifications; published data standards; documentation of valid object construction.	Complete	Repository policy documentation Submission agreements Archivematica documentation Repository technical documentation	Archivematica documentation at https://www.archivematica.org/wiki/Documentation
4.1.4 The repository shall have mechanisms to appropriately verify the identify of the Producer of all materials.	Legally binding submission agreements/deposit agreements/deeds of gift; evidence of appropriate technological measures; logs from procedures and authentications.	Complete	Repository policy documentation Submission agreements Transmittal forms Deeds of gift AFS authentication logs (RO)	Need to formalize submission agreement with RO
4.1.5 The repository shall have an ingest process which verifies each SIP for completeness and correctness.	Appropriate Preservation Policy and Preservation Implementation Plan documents and system log files from system(s) performing ingest procedure(s); logs or registers of files received during the transfer and ingest process; documentation of standard operating procedures, detailed procedures, and/or workflows; format registries; definitions of completeness and correctness.	Complete	Repository policy documentation Archivematica documentation Repository technical documentation	Archivematica documentation at https://www.archivematica.org/wiki/Documentation RO submissions automaticaly verified during ingest process
4.1.6 The repository shall obtain sufficient physical control over the Digital Objects to preserve them.	Documents showing the level of physical control the repository actually has. A separate database/metadata catalog listing of all the digital objects in the repository and metadata sufficient to validate the integrity of those objects (file size, checksum, hash, location, number of copies, etc.).	Complete	Repository policy documentation METS files Preservation metadata in Fedora	METS files created during Archivematica ingest process contain preservation metadata, including file size and checksum
4.1.7 The repository shall provide the producer/depositor with appropriate responses at agreed points during the ingest processes.	Submission agreements/deposit agreements/deeds of gift; workflow documentation; standard operating procedures; evidence of "reporting back" such as reports, correspondence, memos, or emails.	Complete	E-mail correspondence w/RO	No obligation to report back to donors working through the standard Archives accessioning process, per current general donor agreements.

4.1.8 The repository shall have contemporaneous records of actions and administration processes that are relevant to content acquisition.	Written documentation of decisions and/or action taken; preservation metadata logged, stored, and linked to pertinent digital objects; confirmation receipts sent back to providers.	Complete	METS files Preservation metadata in Fedora E-mail correspondence w/RO	METS files created during Archivematica ingest process contain preservation metadata, including events. No obligation to report back to donors working through the standard Archives accessioning process, per current general donor agreements.
4.2 Ingest: Creation of the AIP				
4.2.1 The repository shall have for each AIP or class of AIPs preserved by the repository an associated definition that is adequate for parsing the AIP and fit for long-term preservation needs.		Complete	See below	
4.2.1.1 The repository shall be able to identify which definition applies to which AIP.	Documentation clearly linking each AIP, or class of AIPs, to its definition.	Complete	Archivematica documentation Repository technical documentation	Archivematica documentation at https://www.archivematica.org/wiki/Documentation Spartan Archive Ingest Process Programs Used➔Ingest Programs➔Ingest2
4.2.1.2 The repository shall have a definition of each AIP that is adequate for long-term preservation, enabling the identification and parsing of all the required components within that AIP.	Demonstration of the use of the definitions to extract Content Information and PDI (Provenance, Access Rights, Context, Reference, and Fixity Information) from AIPs. It should be noted that the Provenance of a digital obejct, for example, may be extended over time to reflect additional preservation actions.	Complete	Archivematica documentation Repository technical documentation Fedora records	Archivematica documentation at https://www.archivematica.org/wiki/Documentation Spartan Archive Ingest Process Programs Used➔Ingest Programs➔Ingest2
4.2.2 The repository shall have a description of how AIPs are constructed from SIPs.	Process description documents; documentation of SIP-AIP relationship; clear documentation of how AIPs are derived from SIPs.	Complete	Archivematica documentation Repository technical documentation	Archivematica documentation at https://www.archivematica.org/wiki/Documentation Spartan Archive Ingest Process Programs Used➔Ingest Programs➔GetIngestFiles + Ingest2
4.2.3 The repository shall document the final disposition of SIPs.			See below	
4.2.3.1 The repository shall follow documented procedures if a SIP is not incorporated into an AIP or discarded and shall indicate why the SIP was not incorporatd or discarded.	System processing files; disposal records; donor or depositor agreements/deeds of gift; provenance tracking system; system log files; process description documents; documentation of SIP relationship to AIP; clear documentation of how AIPs are derived from SIPs; documentation of standard/process against which normalization occurs; documentation of normalization outcome and how the resulting AIP is different from the SIP(s).	Complete	Archivematica dashboard and logs Repository technical documentation	Spartan Archive: Ingesting a Records Collection
4.2.4 The repository shall have and use a convention that generates persistent, unique identifiers for all AIPs.	Documentation describing naming convention and physical evidence of its application (e.g., logs).	Complete	Archivematica documentation AIPs file directory on IX Storage Repository technical documentation Fedora logs	Archivematica documentation at https://www.archivematica.org/wiki/Documentation
4.2.4.1 The repository shall uniquely identify each AIP within the repository.		Complete	See 4.2.4	
4.2.4.1.1 The repository shall have unique identifiers.		Complete	See 4.2.4	

4.2.4.1.2 The repository shall assign and maintain persistent identifiers of the AIP and its components so as to be unique within the context of the repository.		Complete	See 4.2.4	
4.2.4.1.3 Documentation shall describe any processes used for changes to such identifiers.		Incomplete--?	See 4.2.4	Not applicable. Identifiers are not changed. If content needs to be reingested, the original AIP is removed. New content is given a new identifier.
4.2.4.1.4 The repository shall be able to provide a complete list of all such identifiers and do spot checks for duplications.		Complete	See 4.2.4	
4.2.4.1.5 The system of identifiers shall be adequate to fit the repository's current and foreseeable future requirements such as numbers of objects.		Complete	See 4.2.4	
4.2.4.2 The repository shall have a system of reliable linking/resolution services in order to find the uniquely identified object, regardless of its physical location.	Documentation describing naming convention and physical evidence of its application (e.g., logs).	Complete	Repository policy documentation Archivists' Toolkit records Fedora logs	Processing procdures in repository policy documentation describe how ingests are named and documentted in Archivists' Toolkit
4.2.5 The repository shall have access to necessary tools and resources to provide authoritative Representation Information for all of the digital objects it contains.	Subscription or access to registries of Representation Information (including format registries); viewable records in local registries (with persistent links to digital objects); database records that include Representation Information and a persistent link to relevant digital objects.	Complete	Archivematica documentation XML specifications PDF specifications	Archivematica processing includes use of format registries XML: http://www.w3.org/standards/xml/ PDF: ISO 32000, Adobe at http://www.adobe.com/devnet/pdf/pdf_reference.html http://www.adobe.com/devnet/pdf/pdf_reference_archive.html
4.2.5.1 The repository shall have tools or methods to identify the file type of all submitted Data Objects.		Complete	Archivematica documentation Repository technical documentation	Archivematica processing includes file identification
4.2.5.2 The repository shall have tools or methods to determine what Representation Information is necessary to make each Data Object understandable to the Designated Community.		Complete	See 4.2.5	
4.2.5.3 The repository shall have access to the requisite Representation Information.		Complete	See 4.2.5	
4.2.5.4 The repository shall have tools or methods to ensure that the requisite Representation Information is persistently associated with the relevant Data Objects.		Complete	Archivematica documentation Repository technical documentation	METS files for Archivematica ingests Fedora Metadata
4.2.6 The repository shall have documented processes for acquiring Preservation Description Information (PDI) for its associated Content Information and acquire PDI in accordance with the documented processes.	Standard operating procedures; manuals describing ingest procedures; viewable documentation on how the repository acquires and manages Preservation Description Information (PDI); creation of checksums or digests; consulting with Designated Community about Context.	Complete	Archivematica documentation Repository technical documentation	PDI found in: METS files for Archivematica ingests Fedora Metadata
4.2.6.1 The repository shall have documented processes for acquiring PDI.		Complete	See 4.2.6	
4.2.6.2 The repository shall execute its documented processes for acquiring PDI.		Complete	See 4.2.6	

4.2.6.3 The repository shall ensure that the PDI is persistently associated with the relevant Content Information.		Complete	See 4.2.6	
4.2.7 The repository shall ensure that the Content Information of the AIPs is understandable for their Designated Community at the time of creation of the AIP.	Test procedures to be run against the digital holdings to ensure their understandability to the defined Designated Community; records of such tests being performed and evaluated; evidence of gathering or identifying Representation Information to fill any intelligibility gaps which have been found; retention of individuals with the discipline expertise.	Incomplete--?		No documented process Testing is informal Errors in Archivematica ingested content investigated and reported to Artefactuel Errors in Spartan Archive reported and corrected
4.2.7.1 The repository shall have a documented process for testing understandability for their Designated Communities of the Content Information of the AIPs at their creation.		Incomplete--?		See 4.2.7
4.2.7.2 The repository shall execute the testing process for each class of Content Information of the AIPs.		Incomplete--?		See 4.2.7
4.2.7.3 The repository shall bring the Content Information of the AIP up to the required level of understandabiity if it fails the understandability testing.		Incomplete--?		See 4.2.7
4.2.8 The repository shall verify each AIP for completeness and correctness at the point it is created.	Description of the procedure that verifies completeness and correctness; logs of the procedure.	Complete	Archivematica documentation Repository technical documentation	Archivematica documentation at https://www.archivematica.org/wiki/Documentation Spartan Archive Ingest Process Programs Used➔Ingest Programs➔GetIngestFiles + Ingest2
4.2.9 The repository shall provide an independent mechanism for verifying the integrity of the collection as a whole.	Documentation provided for 4.2.1 through 4.2.4; documented agreements negotiated between the producer and the repository (see 4.1.1-4.1.8); logs of material received and associated action (receipt, action, etc.) dates; logs of periodic checks.	Complete	Repository policy documentation Archivematica documentation Submission agreements Transmittal forms Deeds of gift AFS authentication logs (RO) Submission console logs Fedora logs Fixity check logs Repository technical documentation	Archivematica documentation at https://www.archivematica.org/wiki/Documentation Spartan Archive Ingest Process
4.2.10 The repository shall have contemporaneous records of actions and administration processes that are relevant to AIP creation.	Written documentation of decisions and/or action taken with timestamps; preservation metadata logged, stored, and linked to pertinent digital objects.	Complete	METS files for Archivematica ingests Submission console logs Fedora logs Preservation metadata in Fedora	
4.3 Preservation Planning				
4.3.1 The repository shall have documented preservation strategies relevant to its holding.	Evidence: Documentation identifying each preservation risk identified and the strategy for dealing with that risk.	Complete	Repository policy documenation	Digital Preservation Strategies section
4.3.2 The repository shall have mechanisms in place for monitoring its preservation environment.	Surveys of the Designated Community of the repository.	Incomplete	Original surveys of Designated Community	Need plan to regularly survey Designated Community

4.3.2.1 The repository shall have mechanisms in place for monitoring and notification when Representation Information is inadequate for the Designated Community to understand the data holdings.	Subscription to a Representation Information registry service; subscription to a technology watch service; surveys amongs its Designated Community members; relevant working processes to deal with this information.	Incomplete	Archivematica documentation	Archivematica processing includes use of format registries Need plan to regularly survey Designated Community
4.3.3 The repository shall have mechanisms to change its preservation plans as a result of its monitoring activities.	Preservation Plans tied to formal or informal technology watch(es); preservation planning or processes that are timed to shorter intervals (e.g., not more than five years); proof of frequent Preservation Policies and Preservation Plans updates; sections of Preservation Policies that address how plans may be updated and that address how often the plans are required to be reviewed and reaffirmed or updated.	Complete	Repository policy documentation	Digital Preservation Strategies section
4.3.3.1 The repository shall have mechanisms for creating, identifying, or gathering any extra Representation Information required.	Subscription to a format registry service; subscription to a technology watch service; preservation plans.	Incomplete--?		Not really necessary, as we ingest digital objects in standard formats.
4.3.4 The repository shall provide evidence of the effectiveness of its preservation planning.	Collection of appropriate preservation metadata; proof of usability of randomly selected digital objects held within the system; demonstrable track record for retaining usable digital objects over time; Designated Community polls.	Complete	METS files for Archivematica ingests Preservation metadata in Fedora Usability testing	
4.4 AIP Preservation				
4.4.1 The repository shall have specifications for how the AIPs are stored down to the bit level.	Documentation of the format of AIPs; EAST and Data Entity Dictionary Specification Language (DEDSL) descriptions of the data components (see references [B6] and [B7]).	Complete	Archivematica documentation Repository technical documentation	Archivematica documentation at https://www.archivematica.org/wiki/Documentation
4.4.1.1 The repository shall preserve the Content Information of AIPs.	Preservation workflow procedure docuementation; workflow procedure documentation; Preservation Policy documents specifying treatment of AIPs and under what circumstances they may ever be deleted; ability to demonstrate the sequence of conversions for an AIP for any particular digital object or group of objects ingested; documentation linking ingested objects and the current AIPs.	Complete	Repository policy documentation Archivematica documentation Repository technical documentation	Archivematica documentation at https://www.archivematica.org/wiki/Documentation
4.4.1.2 The repository shall actively monitor the integrity of AIPs.	Fixity information (e.g., chcksums) for each ingested digital object/AIP; logs of fixity checks; documentation of how AIPs and Fixity information are kept separate; documentation of how AIPs and accession registers are kept separate.	Complete	Repository policy documentation Repository technical documentation	Regular fixity checks on stored AIPs
4.4.2 The repository shall have contemporaneous records of actions and administration processes that are relevant to storage and preservation of the AIPs.	Written documentation of decisions and/or action taken; preservation metadata logged, stored, and linked to pertinent digital objects.	Complete	METS files for Archivematica ingests Submission console logs Preservation metadata logged/stored in Fedora	
4.4.2.1 The repository shall have procedures for all actions taken on AIPs.	Written documentation describing all actions that can be performed against an AIP.	Complete	Repository policy documentation	
4.4.2.2 The repository shall be able to demonstrate that any actions taken on AIPs were compliant with the specifications of those actions.	Preservation metadata logged, stored, and linked to pertinent digital obejcts and documentation of that actions; proedural audits of the repository showing that all actions conform to the documented processes.	Complete	METS files for Archivematica ingests Preservation metadata logged/stored in Fedora	
4.5 Information Management				
4.5.1 The repository shall specify minimum metadata requirements to enable the Designated Community to discover and identify material of interest.	Retrieval and descriptive information, discovery metadata, such as Dublin Core, and other documentaiton describing the object.	Complete	Repository policy documentation	Descriptive metadata based on Dublin Core

4.5.2 The repository shall capture or create minimum descriptive metadata and ensure that it is associated with the AIP.	Descriptive metadata; internal or external persistent identifier or locator that is associated with the AIP (see also 4.2.4 about persistent, unique identifier); system documentation and technical architecture; depositor agreements; metadata policy documentation, incorporating details of metadata requirements and a statement describing where responsibility for its procurement falls; process workflow documentation.	Complete	Archivematica documentation Repository technical documentation	Archivematica documentation at https://www.archivematica.org/wiki/Documentation Spartan Archive Ingest Process Programs Used➔Ingest Programs➔ Ingest2
4.5.3 The repository shall maintain bi-directional linkage between each AIP and its descriptive information.	Descriptive metadata; persistent identifier or locator associated with AIP; documented relationship between the AIP and its metadata; system documentation and technical architecture; process workflow documentation.	Complete	Archivematica documentation Repository technical documentation Metadata logged/stored in Fedora	Persistent identifer associated w/ each AIP Archivematica documentation at https://www.archivematica.org/wiki/Documentation Spartan Archive Ingest Process Programs Used➔Ingest Programs➔ Ingest2
4.5.3.1 The repository shall naintain the association between its AIPs and their descriptive information over time.	Log detailing ongoing maintenance or checking of the integrity of the data and its relationships to the associated descriptive information, especially following repair or modification of the AIP; legacy descriptive metadata; persistence of identifier or locator; documented relationship between AIP and its descriptive information; system documentation and technical architecture; process workflow documentation.	Complete	Archivematica documentation Repository technical documentation Metadata logged/stored in Fedora	Persistent identifer associated w/ each AIP Archivematica documentation at https://www.archivematica.org/wiki/Documentation Spartan Archive Ingest Process Programs Used➔Ingest Programs➔ Ingest2
4.6 Access Management				
4.6.1 The repository shall comply with Access Policies	Statements of policies that are available to the user communities; information about user capabilities (authentication matrices); logs and audit trails of access requests; explicit tests of some types of access.	Complete	Repository policy documentation	Public access system not yet available for non-RO content; researchers can make requests for archivists to retrieve
4.6.1.1 The repository shall log and review all access management failures and anomalies.	Access logs; capability of the system to use automated analysis/monitoring tools and generate problem/error messages; notes of reviews undertaken or action taken as a result of reviews.	Complete	Tomcat server error logs	Only applicable to RO content at this time; archivists manually retrieve non-RO content
4.6.2 The repository shall follow policies and procedures that enable the dissemination of digital objects that are traceable to the originals, with evidence supporting their authenticity.	System design documents; work instructions (if DIPs involve manual processing); process walkthroughs; production of a sample with evidence of authenticity; documentation of community requirements for evidence of authenticity.	Complete	Archivematica documentation Repository technical documentation	Archivematica documentation at https://www.archivematica.org/wiki/Documentation Spartan Archive Ingest Process Programs Used➔Ingest Programs + Database Load Programs
4.6.2.1 The repository shall record and act upon problem reports about errors in data or responses from users.	System design documents; work instructions (if DIPs involve manual processing); process walkthroughs; logs of orders and DIP production; documentation of error reports and the actions taken.	Incomplete		We could add this to "Contact Us" on website.

MSU Trusted Digital Repository: TRAC Checklist Section C

Metric	Example Evidence	Response	Documentation	Notes
5 Infrastructure and Security Risk Management				
5.1 Technical Infrastructure Risk Management				
5.1.1 The repository shall identify and manage the risks to its preservation operations and goals assocated with system infrastructure.	Infrastructure inventory of system components; periodic technology assessments; estimates of system component lifetime; export of authentic records to an independent system; use of strongly community supported software, e.g., Apache, iRODS, Fedora); recreation of archives from backups.	Complete	Repository policy.	In the storage section. Also, infrastructure system is organized and catalogued by the enterprise systems (virtual servers).
5.1.1.1 The repository shall employ technology watches or other technology monitoring notification systems.	Management of periodic technology assessment reports. Comparison of existing technology to each new assessment.	Complete	Repository policy.	Membership in some software announcement lists. Automatic checks and messages of software updates on servers.
5.1.1.1.1 The repository shall have hardware technologies appropriate to the services it provides to its designated communities.	Maintenance of up-to-date Designated Community technology, expectations, and use profiles; provision of bandwidth adequate to support ingest and use demands; systematic elicitation of feedback regarding hardware and service adequacy; maintenance of current hardware inventory.	Complete	Repository policy.	The system is a combination of a dedicated storage system and virtual systems on an enterprise stack.
5.1.1.1.2 The repository shall have procedures in place to monitor and receive notifications when hardware technology changes are needed.	Audits of capacity versus actual usage; audits of observed error rates; audits of performance bottlenecks that limit ability to meet user community access requirements; documentation of technology watch assessments; documentation of technology updates from vendors.	Complete	Repository policy.	Subscription to announcement email from dedicated storage system. Remaining hardware is part of a shared enterprise stack that is reviewed and updated appropriately.

5.1.1.1.3 The repository shall have procedures in place to evaluate when changes are needed to current hardware.	Evaluation procedures in place; documented staff expertise in each technology subsystem.	Complete	Repository policy.	Dedicated storage system is a similar device to other storage systems used and managed by staff who are experienced with updating and migrating storage. Virtual servers is on a virtual stack that is managed by staff who are experienced with updating and migrating resources.
5.1.1.1.4 The repository shall have procedures, commitment, and funding to replace hardware when evaluation indicates the need to do so.	Statement of commitment to provide expected and contracted levels of service; evidence of ongoing financial assets set aside for hardware procurement; demonstration of cost savings through amortized cost of new system.	Incomplete	Repository policy.	Repository policy documentation and submission agreements commit to this. Enough resources exist for the forseeable future, but not long-term future. Integration of archives and central IT.
5.1.1.1.5 The repository shall have software technologies appropriate to the services it provides to its designated communities.	Maintenance of up-to-date Designated Community technology, expectations, and use profiles; provision of software systems adequate to support ingest and use demands; systematic elicitation of feedback regarding software and service adequacy; maintenance of a current software inventory.	Complete	Repository policy.	Software technologies are available for archivists (management), clients (submission), and researchers (access). Repository policy documentation explains in further detail.

5.1.1.1.6 The repository shall have procedures in place to monitor and receive notifications evaluate when software changes are needed.	Audits of capacity versus actual usage; audits of observed error rates; audits of performance bottlenecks that limit ability to meet user community access requirements; documentation of technology watch assessments; documentation of software updates from vendors.	Complete	Repository policy.	Membership in software announcement lists. Automatic checks and messages of software updates on servers. Archivists participate in communities that address technology watches including internal community created with another unit on campus with similar needs (institution's library).
5.1.1.1.7 The repository shall have procedures in place to evaluate when changes are needed to current software.	Evaluation procedures in place; documented staff expertise in each software technology subsystem.	Complete	Repository policy.	Membership in software announcement lists. Automatic checks and messages of software updates on servers. Access to IT Staff to apply updates and changes.
5.1.1.1.8 The repository shall have procedures, commitment, and funding to replace software when evaluation indicates the need to do so.	Statement of commitment to provide expected and contracted levels of service; evidence of ongoing financial assets set aside for software procurement; demonstration of cost savings through amorized cost of new system.	Complete	Repository policy documentation and submission agreement.	Majority of software is free and open. IT Staff available for customized software. See repository policy documentation and submission agreement for more details.
5.1.1.2 The repository shall have adequate hardware and software support for backup functionality sufficient for preserving the repository content and tracking repository functions.	Documentation of what is being backed up and how often; audit log/inventory of backups; validation of completed backups; disaster recovery plan, policy, and documentation; fire drills; testing of backups; support contracts for hardware and software for backup mechanisms; demonstrated preservation of system metadata such as access controls, location of replicas, audit trails, checksum values.	Complete	Repository policy.	Storage is a combination of dedicated storage with secondary dedicated storage copy (dark archives). Other storage is enterprise level with enterprise-level backups. Regular integrity checks performed. See Repository policy documentation.

5.1.1.3 The repository shall have effective mechanisms to detect bit corruption or loss.	Documents that specify bit error detection and correction mechanisms used; risk analysis; error reports; threat analysis; periodic analysis of the integrity of repository.	Complete	Repository policy. Technical documentation.	Regular integrity checks performed.
5.1.1.3.1 The repository shall record and report to its administration all incidents of data corruption or loss, and steps shall be taken to repair/replace corrupt or lost data.	Procedures related tor reporting incidents to administrators; preservation metadata (e.g., PDI) records; comparison of error logs to reports to administration; escalation procedures related to data loss; tracking of sources of incidents; remediation actions taken to remove sources of incidents.	Complete	Preservation metadata in Fedora. Preservation metadata generated by Archivematica. Fixity checks documented in repository policy.	
5.1.1.4 The repository shall have a process to record and react to the availability of new security updates based on a risk-benefit assessment.	Risk register (list of all patches available and risk documentation analysis); evidence of update processes (e.g., server update manager daemon); documentation related to the update installations.	Complete	Repository policy.	Email list subscriptions. Software that regularly checks and communicates necessary updates.
5.1.1.5 The repository shall have defined processes for storage media and/or hardware change (e.g., refreshing, migration).	Documentation of migration processes; policies related to hardware support, maintenance, and replacement; documentation of hardware manufacturers' expected support life cycles; policies related to migration of records to alternate hardware systems.	Complete	Repository policy. Technical documentation.	Dedicated storage has a support plan in place with vendor. Enterprise systems from central IT have procedures and trained staff.
5.1.1.6 The repository shall have identified and documented critical processes that affect its ability to comply with its mandatory responsibilities.	Traceability matrix between processes and mandatory requirements.	Complete	Repository policy.	
5.1.1.6.1 The repository shall have a documented change management process that identifies changes to critical processes that potentially affect the repository's ability to comply with its mandatory responsibilities.	Documentation of change management process; assessment of risk associated with a process change; analysis of the expected impact of a process change; comparison of logs of actual system changes to processes versus associated analyses of their impact and criticality.	Incomplete	Repository policy.	Central IT services that provide enterprise support use the IT Services change management processes. SLA to be created to indicate adequate maintenance times and formalize current process to notify users of changes.

5.1.1.6.2 The repository shall have a process for testing and evaluating the effect of changes to the repository's critical processes.	Documented testing procedures; documentation of results from prior tests and proof of changes made as a result of tests; analysis of the impact of a process change.	Complete	Repository policy. Internal documentation.	Internal technical documentation of testing procedures. Use of a Quality Assurance (QA) and Development (dev) systems for release management.
5.1.2 The repository shall manage the number and location of copies of all digital objects.	Random retrieval tests; validation of object existence for each registered location; validation of a registered location for each object on storage systems; provenance and fixity checking information; location register/log of digital objects compared to the expected number and location of copies of particular objects.	Complete	Repository policy.	Fixity checking information. Fedora software functionality. Spot checks via read-access to storage.
5.1.2.1 The repository shall have mechanisms in place to ensure any/multiple copies of digital objects are synchronized.	Workflows; system analysis of how long it takes for copies to synchronize; procedures/documentation of synchronization processes.	Complete	Repository policy.	Dedicated storage copies regularly to a second (dark) dedicated storage. Enterprise storage is backed up by an enterprise system. Documentation of synchronization process in repository policy.
5.2 Security Risk Management				
5.2.1 The repository shall maintain a systematic analysis of security risk factors associated with data, systems, personnel, and physical plant.	Repository employs the codes of practice found in the ISO 27000 series of standards system control list; risk, threat, or control analysis.	Complete	Repository policy.	Risk factors, security, and backup documented in the repository policy.
5.2.2 The repository shall have implemented controls to adequately address each of the defined security risks.	Repository employs the codes of practice found in the ISO 27000 series of standards system control list; risk, threat, or control analyses; and addition of controls based on ongoing risk detection and assessment. Repository maintains ISO 17799 certification.	Incomplete	Repository policy.	Risk factors and disaster recovery documented in the repository policy. See 5.2.4.

5.2.3 The repository staff shall have delineated roles, responsibilities, and authorizations related to implementing changes within the system.	Repository employs the codes of practice found in the ISO 27000 series of standards; organizational chart; system authorization documentation. Repository maintains ISO 17799 certification.	Complete	Repository policy.	Repository policy documentation explains how permissions and roles are used to grant and control read and/or write access to systems.
5.2.4 The repository shall have suitable written disaster preparedness and recovery plan(s), including at least one off-site backup of all preserved information together with an off-site copy of the recovery plan(s).	Repository employs the codes of practice found in the ISO 27000 series of standards; disaster and recovery plans; information about and proof of at least one off-site copy of preserved information; service continuity plan; documentation linking roles with activities; local geological, geographical, or meteorological data or threat assessments.Repository maintains ISO 17799 certification.	Incomplete	Repository policy.	Plans to implement off-site distributed or cloud backup.