MHHS PROGRAMME

Industry-led, Elexon facilitated

E2E Sandbox Guidance

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1   Contents

1.1 Change Record

Date	Author	Version	Change Detail
3 June 2024	Stuart Scott	0.1	• Initial Draft
11 June 2024	Stuart Scott	0.2	• Updated following internal review
18 June 2024	Stuart Scott	0.3	• Updated following SRO and Code Bodies review. • Version issued for Industry Consultation
8 July 2024	Stuart Scott	0.4	• Updates made in line with Industry consultation comments received
19 July 2024	Stuart Scott	1.0	• Baseline version created post approval at QAG on 18 July 2024
14 March 2025	Stuart Scott	2.0	• Internal version - Updated dates to reflect updated programme Plan post approval of MHHS Change Request CR055 - Amendments to M10 and corresponding milestones • Updated references to latest document versions
25 April 2025	Stuart Scott	2.1	• Internal version - Updates made to reflect *PPIR - Proposed use and value provided from the defined Sandbox using the UIT and SIT-A environments*, issued Apr 2025.
16 May 2025	Stuart Scott	2.2	• Updates made post final Internal Programme review
26 May 2025	Stuart Scott	2.3	• Version submitted to QWG for review and approved by QAG
24 November 2025	Non-SIT S&A Team	2.4	• Version updated to reflect sandbox approach for Non-SIT S&A Participants and Late Entrant LDSO Participants

1.2 References

Ref No.	Document/Link	Publisher	Published	Additional Information
REF-01	E2E Testing & Integration Strategy (MHHS-DEL315)	MHHS Programme	April 2022 v1.0	
REF-02	MHHS Programme Environment Approach & Plan (MHHS-DEL618)	MHHS Programme	January 2025 v4.0	
REF-03	Qualification Approach & Pan (MHHS-DEL1118)	MHHS Programme	April 2024 v2.0	
REF-04	Non-SIT LDSO Qualification Test Data Approach & Plan (MHHS-DEL2455)	MHHS Programme	August 2024 v2.0	
REF-05	Non-SIT S&A Qualification Test Data Approach & Plan (MHHS-DEL2746)	MHHS Programme	April 2025 v1.2	
REF-06	Non-SIT S&A MHHS Qualification Testing Approach & Plan	MHHS Programme	January 2025 v3.0	

1.3　Terminology

Term	Description
	For terminology, see Programme Glossary on the MHHS portal: [Programme Glossary (SharePoint.com)](Programme Glossary)

2   Introduction

End-to-End Sandbox (*E2E Sandbox*) is referenced as a key test stage within the ***Programme E2E Testing and Integration Strategy*** document as part of the User Integration Testing (UIT) testing phase.

E2E Sandbox testing has been proposed as a voluntary test stage where Programme Participants (PPs) can optionally use this testing service, post SIT or Qualification Testing (QT) being completed, to undertake additional testing and continuing to prove their systems and processes.

The optional use of E2E Sandbox by Programme participants is anticipated to help reduce the risk of any negative impacts being experienced within the live service by providing additional testing facilitates and time to continue testing post SIT or QT activities and pre go-live (but could also in be used post-Go-Live).

3   Purpose and Scope

The purpose of this ***E2E Sandbox Guidance*** document is to establish a clear scope for the Sandbox and outline the key principles supporting the creation, set up and operation of the Sandbox test environment for optional use by Programme participants.

This guidance document describes,

- the purpose of the Sandbox testing stage,
- who can use this testing stage,
- when can this test stage be used,
- how the Sandbox environment will be set up
- assumptions on what can be tested using Sandbox and any testing limitations to note
- how the Sandbox may be used by Programme participants

It is expected that this document will be kept under review until the start of Sandbox testing to ensure that the contents remain as reflective as possible. Any required updates beyond the initial baseline version will be proposed and discussed with Qualification and E2E Sandbox Working Group (QWG) and approved by Qualification Advisory Group QAG.

It is expected that a subsequently produced ***E2E Sandbox Test Data Approach and Plan*** will provide additional detail in relation to Test Data to support the principles outlined in this document.

4   E2E Sandbox Testing Stage

The picture below is taken from the ***E2E Testing and Integration Strategy*** document to show where the Sandbox testing stage fits within the overall scope of E2E Testing Phases as part of the User Integration Test (UIT) testing phase. It also highlights the links between Qualification and Sandbox testing, that for a given programme participant, either one of SIT or Qualification Tests must have been completed and associated test completion reports approved before that participant can enter Sandbox testing, should they wish to participate.

- <u>Note</u> – This does not mean that all SIT or Qualification tests must complete before Sandbox testing can begin as it recognises that Programme participants can complete their testing activity at different times.
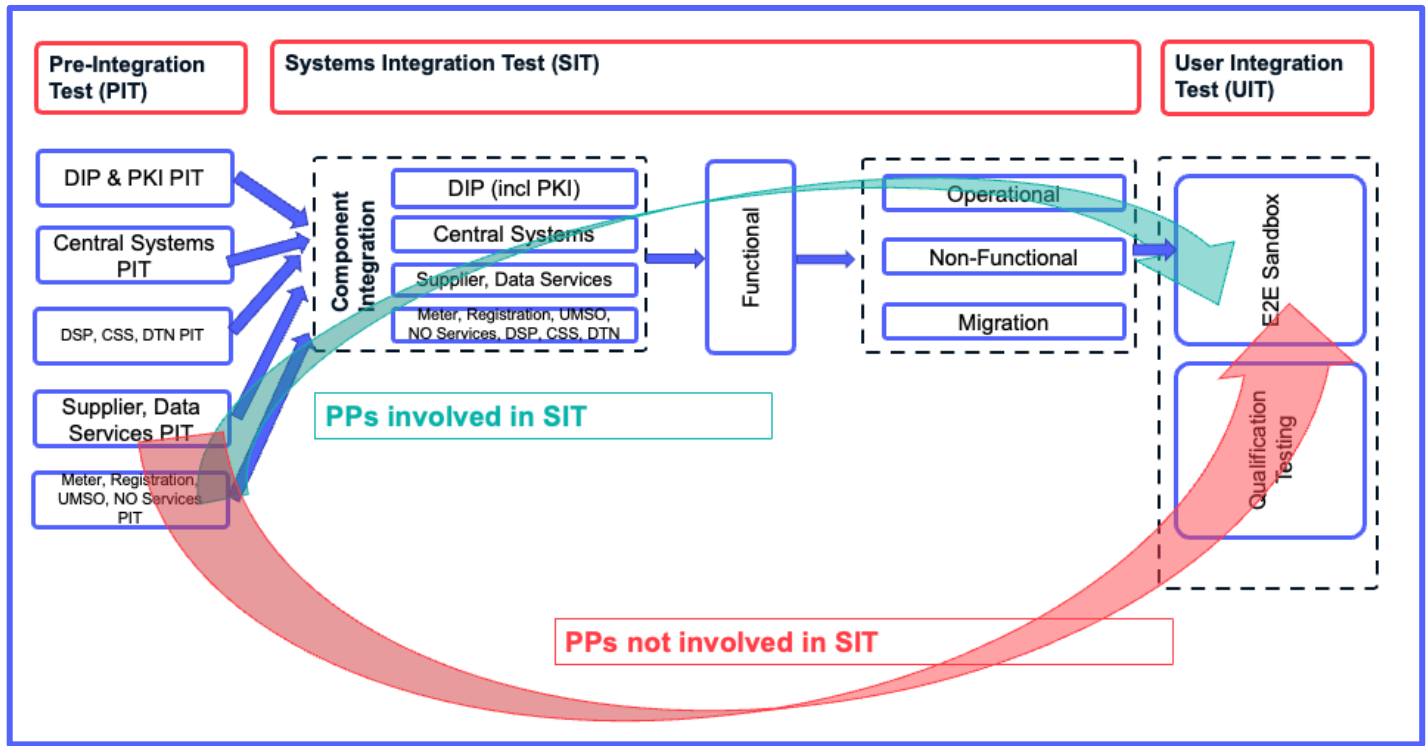
Figure 1 – PPs' path through testing

5 When will the E2E Sandbox, using the UIT environment, be Available?

As part of the User Integration testing phase, E2E Sandbox has assumed the use of the UIT environment.

Sandbox testing using the UIT environment is planned to be available for optional use by Programme participants in line with the following dates dependant on Programme Participant type,

PP Type	E2E Sandbox Testing *(using UIT Environment)*
LDSOs	From 2 Jun 2025
Suppliers & Agents	From 1 Sep 2025

Different Programme Participant types will have different start dates for E2E Sandbox, using the UIT environment. These start dates are linked to the availability of the Test Harnesses that will be used by each PP type to support the use of the Sandbox, recognising that the LDSO Test Harness is available earlier than the Supplier and Agent Test Harness.

The available from date for making this Sandbox testing service available is,

- after the completion of SIT Functional testing,

- after the completion of non-SIT LDSO Qualification Testing (for LDSOs) and,

- in line with the start of Supplier & Agent Qualification Testing (for Supplier and Agents)

The following picture shows where Sandbox Testing fits alongside the other test phases and the interlinks between them to enable the start of Sandbox Testing by PPs from either the 2-Jun-25 onwards for LDSOs or 1-Sep-2025 onwards for Supplier and Agents.
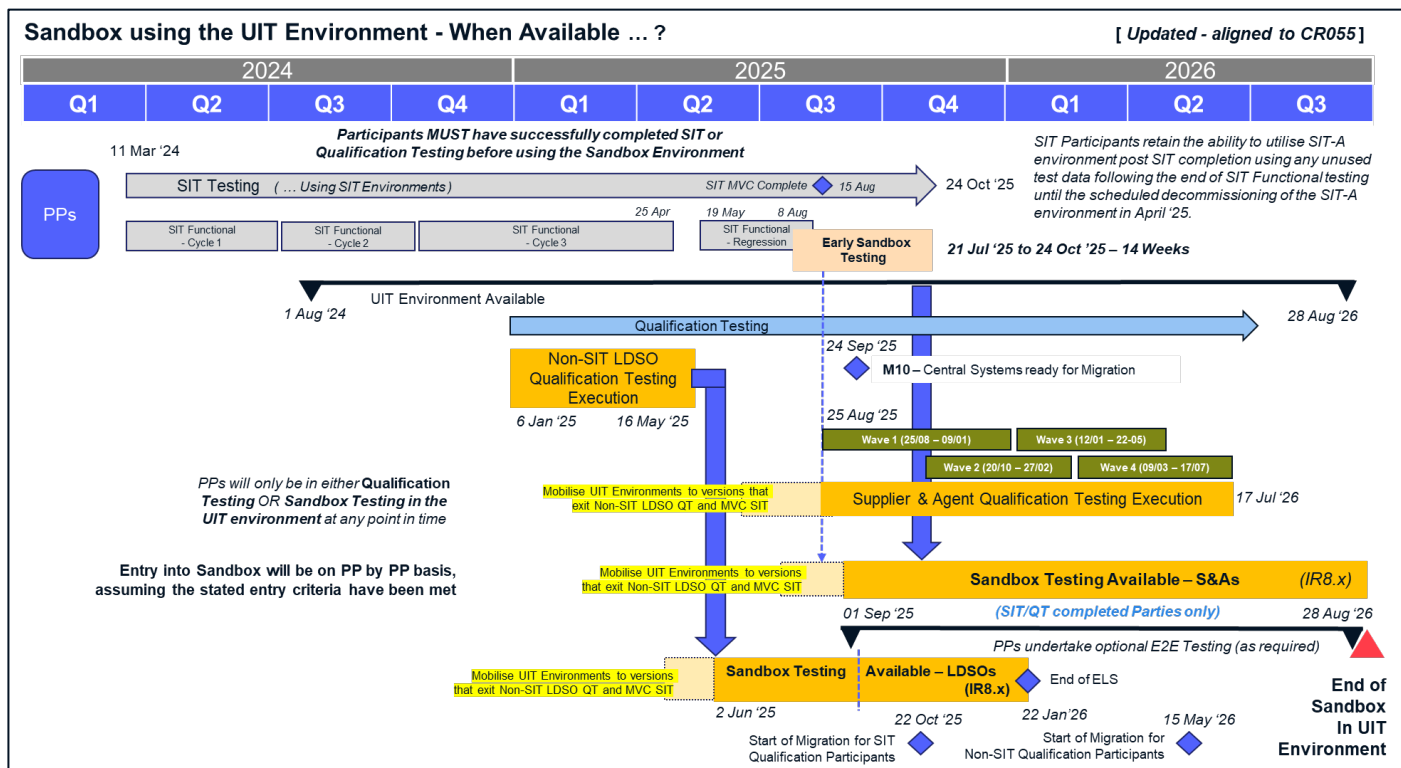
Figure 2 – E2E Sandbox – When Available

6 Risk Mitigation - Early Sandbox testing availability using the SIT-A environment

When the originally proposed 10-Feb-2025 Sandbox start date (subsequentially updated to 1st September 2025) using the UIT environment was discussed at Qualification Working Group (QWG), a potential risk was raised that this date was later than expected for some participants and potentially limits the testing possible and the associated value of Sandbox for some Programme participants. A raised observation was that the Sandbox using the UIT environment would only be available 2 months prior to Migration Start (M11/M12) – original date of 4 Apr 2025 and that may not provide a long enough period for participants who are targeting an early migration start to undertake Sandbox testing.

In order to recognise that the proposed availability dates for Sandbox on the UIT environment are challenging for SIT Participants looking to start early Migration, the Programme will support an additional alternative and/or additional approach to help mitigate this risk.

The Programme will provide and support the additional option for SIT Participants to continue to use the SIT-A environment, as used for SIT testing, to carry out early Sandbox type testing once a SIT Participant has successfully completed all of their SIT testing, but without the need to wait for the formal approval of their SIT Test Completion Report. This is considered to assist SIT Participants with preparation for early migration start and assist as a risk mitigation against the potential risk raised.

This Early Sandbox testing for SIT Participants using the SIT-A environment will be provided on the following basis.

- This is primarily a risk for Supplier and Agent SIT Participants preparing for early migration start, but is an option available if required, for any LDSO, Supplier or Agent SIT Participant.

- SIT Participants would retain the ability to utilise any test data that was unused following the end of SIT testing and the SIT-A environment could be used for Sandbox testing until the scheduled decommissioning of the environment. This was originally planned for 8th April 2025, but now expected to be 24th October 2025.

- The SIT-A environment contains lots of output data available for use from SIT for use in wider PP testing and would be consistent across multiple participants within the same cohort.

- No additional data sets will be provided to Programme Participants for this environment to support this early Sandbox testing.

- Participants can use the standard Business Processes to support the changing of and extending the base SIT Test Data provided for any more specific Sandbox testing that is required. This will need to be planned by each Participant as part of their test approach planning.

- This option is not available for Non-SIT LDSOs or Non-SIT Supplier & Agents as they have no access to the SIT environments, so there is no continued SIT-A environment use option available.

Limitations
- Completion of SIT is the priority testing activity for the Programme and can't be impacted by any Early Sandbox testing by any SIT Participants.

- Each SIT Participant must have completed all of their SIT testing the SIT-A environment can be used for Early Sandbox testing.

  - The principle is that each SIT Participant has successfully completed all of their SIT testing before they could use Early Sandbox testing in SIT-A. This has not been linked between participants within SIT (or between relevant Roles for the same participant) in order to keep as open as possible without introducing any additional dependencies).
  - However, it is recognised that based on SIT testing progressing to date, it is likely that as the test cases are linked between Cohort participants to create E2E tests, in practice it is possible/likely that Cohorts may complete SIT tests at similar times.

- Participants would need to recognise SIT-A environment limitations of operating without Test Harnesses simulating other Participant Roles. Participants must use the existing Cohorts model that is in use for SIT to execute tests. SIT Participants would need to co-ordinate any Early Sandbox testing between cohort parties.

  - Test harnesses installed and connected to the UIT environment to support Sandbox testing will not be available for use in the SIT-A environment.

Please see Appendix A for further details on Qualification Working Group (QWG) options considered relating to supporting for early sandbox testing.

7 Summary of Sandbox Testing available from dates

PP Type	E2E Sandbox Testing (*using UIT Environment*)	RISK MITIGATION ACTIVITY Early Sandbox Testing (*using SIT-A Environment*)
SIT LDSOs	From 2 Jun 2025	Both From 21 Jul 2025
SIT Suppliers & Agents	From 1 Sep 2025	(to 24 Oct 2025)
Non-SIT LDSOs	From 2 Jun 2025	Not available
Non-SIT Suppliers & Agents	From 1 Sep 2025	

Notes

- The intent is to allow SIT Participants to perform Early Sandbox testing, using the SIT-A environment, once they have successfully completed all of their SIT tests and not wait for the formal approval of their Test Completion Report. This approach allows for an earlier availability date for Early Sandbox testing on the SIT-A environment as per the risk mitigation activity.

- **For Sandbox testing, using the UIT environment, all SIT or Qualification tests must have been successfully completed and Test Completion Reports approved before a participant can carry out Sandbox testing, should they wish to participate**.

- SIT Participants who have completed testing have the choice either to,

a)   begin Early Sandbox testing in the SIT-A environment

b)   wait for approval of their Test Completion Reports before using the Sandbox in the UIT environment from a later start date as per the table above

c)   use a combination of both environments or

d)   not perform Sandbox testing.

- Non-SIT Participants can choose to use the Sandbox using the UIT environment or not, in line with the above dates.

8   Potential Limitations for Sandbox (using UIT Environment)

The definition of the Test Environments for Qualification Testing will have a direct influence on the Test Scenarios and Test Use Cases that can be supported within Sandbox testing using the UIT environment.

- The E2E Sandbox will be provided on the basis of being supported by the UIT test environment that is used for the Qualification testing.

- The Central Service environments (i.e. DIP) and Test Harnesses (i.e. QTF and Non-Sit LDSO Test Harness) approved for use in Qualification Testing will determine what facilities are available for Sandbox testing.

- It should be recognised that the E2E Sandbox is not subject to a separate set of requirements to support PPs test activities, the scope of activities that can be undertaken by participants will be determined by what is supported by the UIT environment.

It is recognised that there is a risk for participants to note that that there may be some Test Scenarios that they may wish to test that are not able to be tested within the E2E Sandbox test phase due to the UIT environment creating testing limitations. These potential limitations should be noted when Programme participants are developing their Sandbox testing approaches.

8.1   Key Principles

Conversations with Programme participants at QWG sessions to date have allowed the Programme to discuss, share and conclude some key principles for Sandbox Testing using the UIT environment:

- The Programme will provide a Sandbox test environment

- The Sandbox test environment using the UIT environment, is assumed to be made available to all Programme participants once they have completed either all of their SIT or Qualification Testing, evidenced through the approval of their Test Completion Report, should they wish to participate.

- The Sandbox test environment will be the same environment as the Qualification environment (UIT environment) with the same facilities (e.g. test harnesses) available as being used for Qualification Testing.

- The Sandbox test environment using the UIT environment, is a time limited facility which,

  o   For LDSOs, is available until the end of the Early Life Support (ELS) period, forecast end date of 22nd January 2026.

    ▪   *Caveat – LDSO use of the Sandbox will be monitored during the 4-month period from M10 (24-Sep-2025) to the end of ELS (22-Jan-2026) to ensure that the Sandbox is still being used and delivering value to LDSOs. If there is no use of this service, then support may be proposed to be stood down to save support costs for industry.*

  o   For Supplier and Agents, is available until the end of Qualification Testing, originally planned for 19th January 2026, but now expected to be 28th August 2026.

- Each Programme participant is responsible for defining its own Sandbox testing and providing their own test environments.

- Volume, performance or load testing & any potentially destructive testing is not supported and will be excluded from Sandbox testing.

- The Sandbox test environment uses the same UIT environment as is being used for Qualification Testing (QT) over largely the same time period. In the event that there are any competing testing activities /priorities between Sandbox Testing and Qualification Testing then it should be noted that Qualification Testing activities would always take priority over sandbox testing activities. Supporting Participants with their qualification

process so that they are able to migrate their MPANs into the new MHHS systems as soon as possible is a key Programme priority.

8.2   Potential Limitations

The following potential Sandbox testing limitations, using the UIT environment, should be noted by programme participants:

- The UIT environment is not built to support full scale performance and volume / load testing, this type of testing will not be possible.

- Any form of destructive testing will be excluded from Sandbox testing in order to ensure that the environment remains fit for purpose for the use of all participants.

- The respective test approaches approved to support both Non-SIT LDSOs Qualification Testing and Non-SIT Supplier & Agents Qualification Testing will have an impact on what can be tested, how it can be tested as well as informing and determining some of the associated RACI conditions for Sandbox testing.
  - The finalisation and approval of these test approaches is noted as a key dependency for participants development of their test approach and test definitions for Sandbox testing.
    - The approach to test data for Non-SIT LDSO Qualification Testing is set out in [REF-04]
    - The approach to test data for Non-SIT Supplier and Agent Qualification Testing is set out in [REF-05]
    - *Note* - Test Data definitions are covered in more detail within the subsequently produced ***E2E Sandbox Test Data Approach and Plan*** document. This will provide additional detail to support the principles outlined in this Guidance document.

- The only actual physical systems included within the Sandbox environment apart from the test participants system under test are the DIP (and DTN for QTF).
  - The UIT Environment does not include physical DCC Systems, CSS Systems, EES Systems[1] or Elexon Central Services (Helix) as these are not required to support Qualification Testing. Testing that requires these systems will not be possible in E2E Sandbox.

- The Programme completed, and shared with QWG, a high-level analysis for the option of using Sandbox without the Supplier & Agent Test harness being available and concluded that Sandbox Test Coverage would be severely limited without the use of the Qualification Test Framework (QTF) or an alternative simulation tool.

- Any LDSO using the LDSO test harness can't test with out support from the programme operating the test harness. Whilst support will be available to support LDSO with this, it will be at a reduced from LDSO QT test stages and support may need to prioritise supporting a new entrant LDSO if they need to undertake QT during the same time period as when an already qualified LDSO is using the Sandbox.

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[1] *The EES API will be available during this period to test but is technically not part of the Sandbox environment, meaning it:*
- *Will be available for non MHHS Parties as well as MHHS Parties (TPIs etc.)*
- *Will not be populated with data provided consistent with the data elsewhere in the Sandbox.*
- *Will not update if data is amended through other actions in the Sandbox.*

9 Assumptions for Sandbox Testing (using UIT Environment)

The following section provides the current working assumptions that support the provision of the Sandbox UIT environment.

9.1 Dependencies

- Provision of DIP within the UIT environment

- Provision of Non-SIT LDSO and S&A Qualification environments

- Necessary agreement of test data to be used

- Sandbox Testing will be carried out with the UIT environment, along with the supporting test harnesses, using the latest version of the Programme's Build Release providing a stable environment reflective of the build version planned prior to go-live. Sandbox Testing in the UIT-A environment will initially be aligned to Interim Release 8 (IR8.x) as this is expected to be the last Major Code Release prior to Go-live. It is, therefore, expected that the systems under test will align with the standards and configuration of this IR8 release[2].

  - Ongoing management of the for UIT environment will be in line with the details contained within the *Environment Approach and Plan*

9.2 Who can use the E2E Test Sandbox?

- All Programme participants that are not Central System providers may conduct Sandbox testing, if they choose to do so e.g. LDSOs, Suppliers & Agents.

- The Sandbox environment can't be used by the Central System providers.

9.3 Entry Conditions

There are three key principles that have been considered for determining the entry conditions for Sandbox Testing. These are listed in the table below.

These key principles have been discussed with QWG through the early part of 2024 and further expanded in this document to determine how these principles are interpreted and translated into the Sandbox timelines and delivery plan (See section 5 above for timelines and appendix A for additional supporting details).

When all three key principles and the associated timelines are overlaid together, this provides the rationale for why the start dates have been chosen for when Sandbox testing using the UIT environment is planned to be available as per section 5.

Principle 1 – SIT / Qualification Testing Complete

- **Testing activities must be successfully completed (SIT or Qualification Testing) and their Test Completion Report approved before a participant can use the Sandbox environment for further testing, should they wish to participate**.

  - *Note* - This does not mean that all SIT or Qualification Testing must complete before E2E Sandbox can begin, as each Programme participant can use the E2E Sandbox in line with their own Qualification completion timeline, recognising that Programme participants will qualify at different times.

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[2] *Post Go-live, this will be kept under review in line with the enduring release management approach ensuring that the Sandbox remains in line with the production Code Release version*

- Early access to the E2E Sandbox environment is recommended for Programme participants to use, prior to their formal Qualification approval, via the relevant Governance process[3]. If their Test Completion Reports are approved and they are awaiting the formal outcome of the Qualification process then continuing Testing within the E2E Sandbox is permissible. The benefits of earlier Sandbox testing have been deemed to outweigh the risk of waiting for final PAB approval.

- It is recognised that a Participant can complete SIT or Qualification Testing but their test evidence will need to be assured before they can be said to have passed Qualification Testing.

Principle 2 – Availability of Test Harnesses supporting Sandbox

- **Qualification Testing assumes the use of a Test Harnesses by each Test Participant for simulating the interaction with any other Participant(s) from the one carrying out the testing**

- Two different Test Harnesses are available for use by Participants for Qualification Testing depending on their Role

  - Non -SIT LDSO QT is using the 'Pseudo Market Role' Test Harness / Stub

  - Non-SIT Supplier and Agent QT is using the 'Qualification Test Framework (QTF)' Test Harness / Stub

- Both of the above Test Harnesses need to be available to Participants in order that Sandbox testing can be performed successfully and offers value. This is a key dependency for Sandbox testing.

  - The QTF for Supplier & Agent participants are expected to be available to support the start of Supplier and Agent Qualification Testing.

  - The Test Harnesses supporting LDSO participants are expected to be available earlier than the Supplier and Agent Test Harnesses, as this is required to support the earlier Non-SIT LDSO Qualification Testing activity, which completes prior to any use of the Sandbox using then UIT environment.

- Rationale,

  - Due to the UIT environment limitations (see section 8), Sandbox testing coverage would be severely limited for Participants without the use of the Qualification Test Harnesses or an alternative simulation tool.

  - No physical *Registration Systems* being available within the UIT environment creates a significant testing limitation to business process testing.

Principle 3 – SIT Complete Activity provides confidence in DIP & PP Roles

- **SIT must have completed to a sufficient level to provide confidence for both Central Systems and Participant Role based testing**

- The End of SIT for MVC (Minimum Viable Cohort) must have completed by the Programme in order for the E2E Sandbox to be made available for use.

- The SIT Minimum Viable Cohort Test Exit Report must have been approved confirming that the SIT Minimum Viable Cohort Complete milestone has been met, in order for any Programme participant to progress to using the Sandbox (Programme Milestone – T1-TE-2000).

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[3] Qualification approved by BSC PAB for Suppliers, LDSOs and Data Services. Qualification approved by REC Code Manager for Suppliers, LDSOs and MOAs

- Entry into Sandbox will be on PP by PP basis, therefore SIT / QT test completion reports will be for each party before they can use the Sandbox environment.

Therefore,

- The earliest access to Sandbox for a PP (Supplier or Agent) who has successfully completed SIT should be aligned to the Tier 1 Programme Milestone *T1-TE-2000 - Approval of SIT Minimum Viable Cohort Test Exit Report.* Confirmation that this milestone has been met opens up use of the sandbox environment for participants who have successfully completed SIT.

- In line with the above,

  - SIT participants, can access the sandbox environment when they have successfully completed SIT (triggered by evidencing the approval of their SIT Test Completion Report).

  - Non SIT Participants, can access the sandbox environment once they have successfully completed Qualification Testing (triggered by evidencing the approval of their Qualification Testing Test Completion Report).

9.3.1   Entry Criteria for Supplier and Agent Sandbox Testing

The following outlines the entry criteria for Supplier and Agent Participants wishing to execute testing within the Sandbox environment.

- The Qualification Testing Assurance Team confirms Qualification Test Case (QTC) outcomes have been sufficiently evidenced, supported by an approved Test Completion Report.

- Outstanding PIT artefacts have been submitted and associated actions verified by QT assurance team as assured and completed.

- Sandbox Test Requirements Proforma to be submitted - required for readiness and support planning.

- Sandbox Test Requirements Proforma reviewed and accepted by the Supplier and Agent Qualification Testing Team.

- Start date for Participant Sandbox Testing confirmed with the Supplier and Agent Qualification Testing Team.

9.4   Test Environment

Section 9.9 of the *MHHS Programme Environment Approach & Plan (DEL618)* document contains the details of the environment definition for Sandbox and the diagram below shows the Sandbox Architecture included in the document.
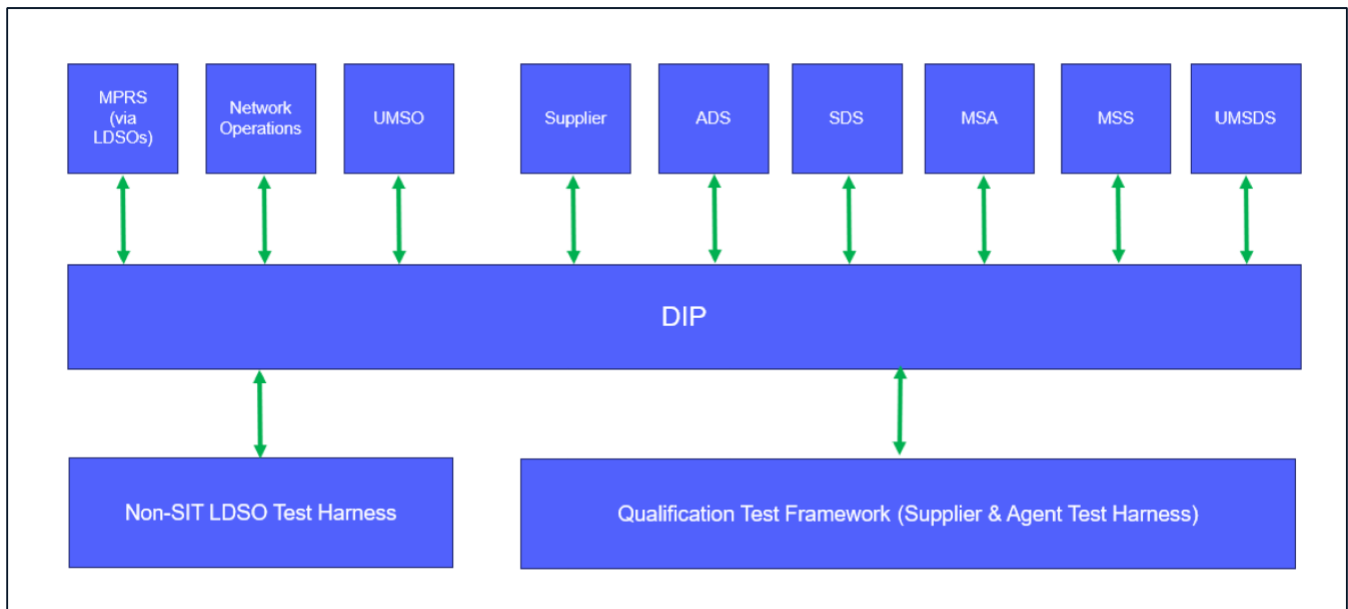
Figure 4 –Sandbox Architecture for UIT Environment

As each Test Harness (Non-SIT LDSO and Supplier & Agent) connects to the same DIP instance within the UIT environment, in effect there are two separate Sandbox environments, each available to a different set of participants, one for LDSOs and the other for Supplier and Agents. This enables the Sandbox to be made available to these different Participants at potentially different start and end dates (based upon the availability of each Test Harness), to ensure that Sandbox environment provision is aligned to the value gained from each set of Participants.

- Test Participants will be responsible for provision of their own test environments and will need to coordinate with the Programme to connect to central systems (e.g. DIP) as per the *MHHS Programme Environment Approach & Plan*.

- The Programme will make available relevant details for establishing connectivity to the Sandbox environment as and when requested by Participant.

  - The working assumptions for Participants connectivity to the Sandbox UIT environment are that,

    - Non-SIT Programme participants will have established connectivity to the UIT environment previously as part of Qualification Testing (managed by the Qualification Testing teams for test harness and by the PPs for DIP connectivity) and so no additional DIP onboarding should be required to use the Sandbox.

    - It is likely that any SIT Programme participants seeking to carry out Sandbox testing will need to establish connectivity to the UIT environment via repeating the onboarding process (similar to recent establishing SIT-B connectivity) . Wider on-boarding activities that extend beyond DIP on-boarding will include things such as Test Harness training, allocation of test data etc. Further details to be provided to Participants in due course by the Programme as part of the UIT environment readiness activities.

- As a general principle, in the event that there is contention between onboarding a Qualification PP or a Sandbox PP then the Qualification PP will take precedence over the Sandbox PP to ensure that Qualification activates are not delayed for PPs. This is not expected to be an issue, but will be monitored.
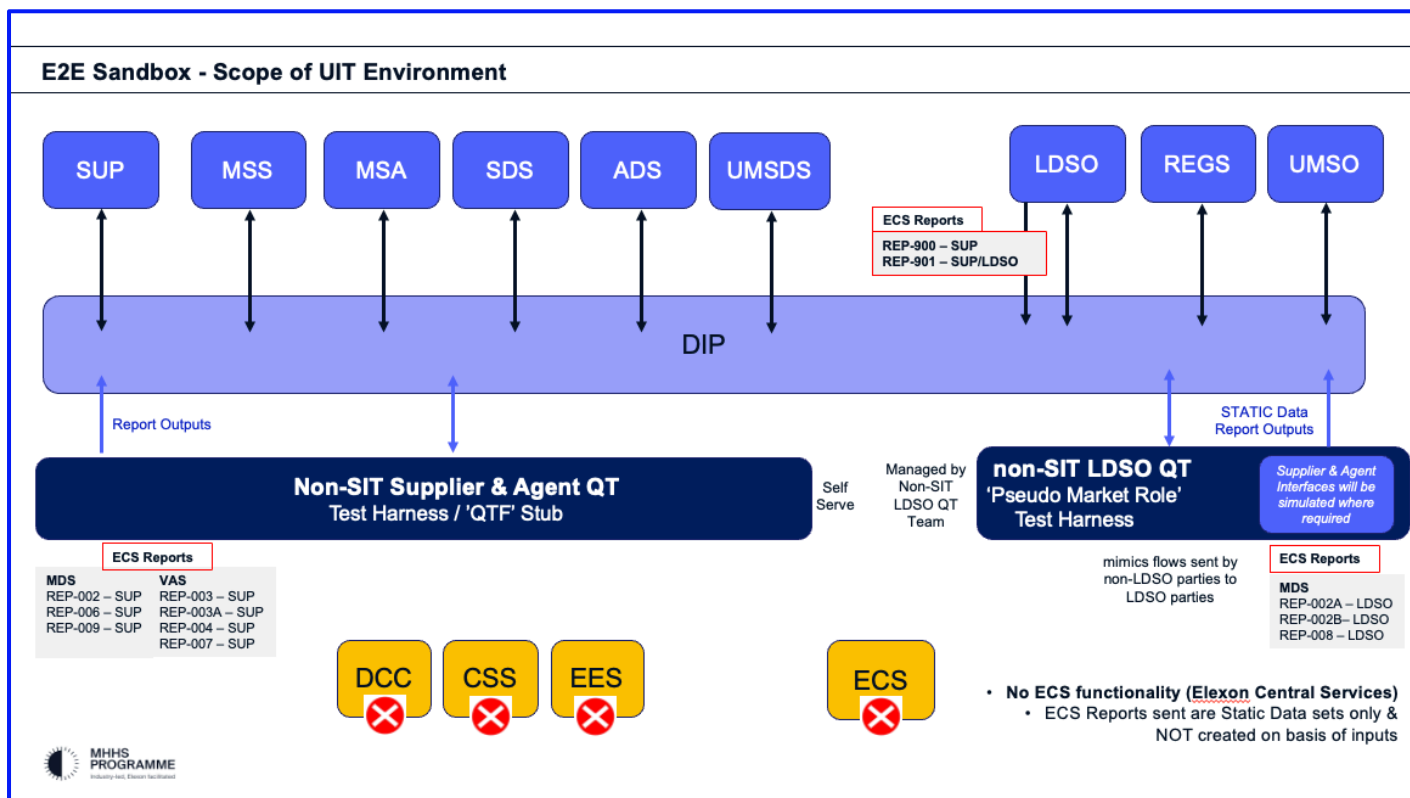
Figure 5 – Scope of the UIT Environment used for Sandbox

The diagram above highlights the following,

- A physical DIP system would be the only other guaranteed available party system alongside the Sandbox Participant's systems

- Each Test Participant will need to rely upon the relevant Test Harness in order to carry out Sandbox testing

9.5 Test Harnesses

- Qualification Testing assumes the use of Test Harness to simulate interactions with any other Participants.

- The Sandbox will re-use the test harnesses developed for non-SIT LDSO Qualification testing and Supplier & Agent Qualification testing to support E2E Sandbox test execution.

  - The use of the 2 test harnesses are mutually exclusive, i.e. LDSOs will only use the non-SIT test harness in the Sandbox and Suppliers & Agents will only use the Qualification test framework harness.

  - Note – as both test harness mimic ECS(HELIX) systems a Sandbox Test Participant may get broadcast message from both ECS(HELIX) systems.

- The assumption is for re-use of the Test Harness products used for Qualification Testing. Therefore, it is assumed that there will be no development of new test stubs/harness to support the E2E Sandbox environment or any additional development updates to the existing test stubs/test harnesses

- All Test Stubs or Test Harnesses required for use for E2E Sandbox will be defined and delivered by the Qualification activities e.g. Non-SIT LDSO Qualification Testing using "*Pseudo Market Role Test Harness*" and Non-SIT Supplier & Agent Qualification Testing using the Qualification Test Framework (QTF) *Test Harness.*

9.6 Test Scenarios and Use Cases

- Each Programme participant is responsible for their own Sandbox testing activities to meet their own needs / requirements, and the test cases they wish to cover / execute

  - Note – Test Cases can only be selected from the available test cases within the Test Harnesses. New Test Cases are not expected to be created to support Sandbox testing.

- Subject to the stated known limitations, Sandbox testing activities are determined by the participant and which tests they wish to undertake. This approach allows a participant to thoroughly test their systems and business processes to the degree they deem appropriate.

- Test Scenarios and Uses Cases that are available to test within Sandbox are the same as used by Programme participants in Qualification.

  - Participants wishing to conduct Sandbox testing using the Non-SIT S&A QTF will only be able to select from the provided set of Qualification Test Cases appropriate to their Market Role.

  - Participants wishing to conduct Sandbox testing using the Non-SIT LDSO Test Harness will need to advise which test scenarios they wish to carry out so that they can be supported by the Test Harness with the relevant associated Test Data.

9.7 Test Data

The working assumption is that Sandbox Test Data is expected to, wherever possible, follow the same approach as defined for Qualification testing and outlined in the following documents.

- Non-SIT LDSO Qualification Testing Test Data Approach and Plan [REF-04]
- Non-SIT S&A Qualification Testing Test Data Approach and Plan [REF-05]

Different test approaches have been proposed to support Non-SIT LDSOs Qualification Testing and Supplier & Agents Qualification Testing.

Complete Test Data definitions including the identification of any required variations required for Sandbox testing will be covered in more detail within the subsequently produced *E2E Sandbox Test Data Approach and Plan* document. This will provide additional detail to support the high-level general principles outlined in this Guidance document.

- Different MPANs shall be used for Qualification Testing and Sandbox Testing to easily identify the Test Phase being executed ensuring that there is no conflict in data between Qualification and Sandbox testing, using the UIT environment, as different MPAN sets are expected to be made available for use in each testing phase. This will create a logical separation for testing activities and mitigate against any potential testing contentions (noting that Participants cannot run Sandbox tests until they have completed Qualification ensuring that these tests will not run in parallel).

  - Sandbox testing will use the UIT test environment, which is shared with two other testing phases (Non-SIT LDSO Qualification and Supplier & Agent Qualification Testing).

  - Note - There will be some reuse of Non-SIT LDSO QT data as the majority of qualification testing will have been completed by LDSOs prior to the start of sandbox Testing. See *E2E Sandbox Test Data Approach and Plan* for further details.

- The Sandbox environment will use the same Industry Standing Data (ISD) data set configured for use in the UIT environment and used for Qualification Testing.

  - Single set of ISD used for supporting the UIT Environment for both Qualification Testing and Sandbox Testing

    - For example, SIT Participants wishing to use the QTF for Sandbox testing will need to be included in Qualification ISD.

    - Note – Participants using the Sandbox should be aware that multiple sets of ISD may be sent to support QT tests, so it may not be appropriate to auto-load all ISD updates as they are likely to in production environments.

- When the ISD is created for the UIT environment the Programme will identify any required additions for Sandbox testing, but the expectation is that ISD should be as production like as possible to support Sandbox Testing.

  - This is anticipated to include the same version of the Master Settlement Timetable (ISD Entity ID M14) to support the compressed Settlement Timetable used in Qualification Testing.

The table below shows a summary of the key current working assumptions relating to Test Data made for each Of the Qualification Test Harnesses.

LDSO Test Harness (Pseudo Market Role) *(used by LDSO participants)*	S&A Test Harness (QTF) *(used by Supplier and Agent participants)*
• Current production data will be used wherever possible to meet the test data conditions defined in the non-SIT LDSO Qualification Testing Test Cases. • This gives the best chance for that data to be populated across UMSO, Registration Services and LDSO test systems in a complete and coherent manner for Non-SIT LDSO Qualification Testing execution.	• Qualification Testing will use realistic, artificial MPANs modelled on Production data
• Test data does not need to fully align between different participants • However, each Non-SIT LDSO will be required to load valid and consistent data across their systems.	• All MPANs will be manufactured by the Non-SIT S&A QT Team
• The onus will then be on the MHHS Programme to: • Generate IF flows from the test harness consistent with this test data. • Populate Helix (or alternative test harness) to support receipt and validation of PUB flows received and to generate static REP flows generated.	• Each MPAN is specific to a Qualification Participant and Qualification Test Case
	• Assumes bulk loading as legacy MPANs in Suppliers' system(s), but not bulk migration. It is MPAN-at-a-time migration.
	• Should a Qualifying Testing Party or SIT Participant wish to use the QTF for Sandbox testing, the Non-SIT S&A QT Team will issue them with a new set of Test MPANs for this purpose. • Issuing new Test MPANs for Sandbox testing will ensure segregation between Qualification and Sandbox testing is maintained.

- As part of Sandbox UIT environment onboarding activities, it is expected that Test Data sets will need to be requested by PPs to align with the type of testing that each PP expects to be carried out to ensure that the Test Cases and Test Data align. This must be within the scope of the Test Cases that are supported by the Test Harnesses.

9.8   Test Readiness

- Each Programme participant is responsible for defining its own Sandbox test strategy, providing their own test environments and where required making arrangements to pair with any other parties they wish to test with for any joint testing.

- It is therefore assumed that there is no requirement for the Programme to track Programme participants Test Readiness for Sandbox testing as it's an optional testing phase re-using the UIT environment that will already be in use by Programme participants and each participant may choose their own start point for Sandbox testing, as and when required.

- LDSO Participants will need to communicate with the Sandbox Support team and inform them of the tests that they are planning to perform and when, so that the test harness can be set up to support these tests.

- The Programme will support Programme participants with any DIP onboarding required for using the Sandbox in the UIT environment.

9.9   Test Execution

- Each Programme participant will execute their chosen tests and report internally according to their own processes for preparation, execution progress and completion.

- The Programme is not expected to monitor each Programme participant's test execution activities or centrally report on this activity. However, it is recognised that the programme may need to support LDSOs with test harness interaction.

  - LDSOs will need to communicate with the Sandbox support team and it is anticipated that there will need to be some flexibility on support lead ties and responses times, depending on many other LDSOs are also executing Sandbox testing at that point in time as there will be a finite amount of resource within the Sandbox support team.

- Primarily, Sandbox test Participants are anticipated to test independently as per Qualification Testing. Test Harnesses are intended to be used to mimic all other MHHS Role activities, as per Qualification Testing.

9.10   Test Management

- The Programme's SI team will produce an overall Plan for Sandbox testing in terms of a high-level framework reflecting start dates, end dates and environment availability between these dates. Each Programme participant will conduct any required optional testing activities within the scope of the relevant Plan.

- The Programme will ensure that a test environment and appropriate data are made available to Participants to allow participants to use the Sandbox environment for the duration of the published Sandbox Test phase.

- Each test participant is responsible for using their own test management tool to support Sandbox testing.

9.11   Defect Management

- Each test participant is responsible and accountable for managing / fixing their own defects and issues identified as part of Sandbox testing activity.

- Programme participants shall be expected to record and manage any test issues that are identified against their own systems or processes during Sandbox testing using their own test management tooling.

- The defect management process for Sandbox will align with that defined for Qualification Testing and SIT (for early Sandbox testing).

- Programme participants shall only raise defects with the Programme's SI team against any issues identified for Central Systems (e.g. the DIP) and the QT Team for the Test Harnesses) and not their own Systems and processes.

- The SI Team will manage any test issues which are raised centrally (i.e. not those fixed by a Programme participant in isolation), assigning responsibility for fixing to the appropriate party as part of the triage process and providing updates on resolution of these back to participants.

- It is expected that Azure DevOps (ADO) will continue to be used as the SI teams Test & defect Management Tool used for Sandbox testing.

- Participants should log defects with the programme if they identify an issue with a central party, or the documentation using the existing Azure DevOps (ADO) tool that is in operation for SIT.

- Defects raised from QT testing will be prioritised above defects identified from Sandbox Testing

9.12 Test Assurance

- Each Programme participant shall be responsible for conducting their own assurance activities for all testing executed.

- The Programme's SI Team will not be involved in Programme participants Test Result Assurance for the tests carried out as part of Sandbox testing. This is the responsibility of each Programme participant.

9.13 Exit Criteria / Conditions

- As Sandbox testing is an optional test phase, there are no formal programme exit criteria / conditions set for Programme participants. Each participant should determine their own exit criteria and monitor whether or not they have achieved their required test objectives before deciding to stop Sandbox testing.

- The E2E Sandbox test environment is a time limited facility which is provided by the Programme and made available to Programme participants until the end of Qualification Testing, originally planned to be completed by Jan '26, but now expected to be completed by end of Aug-2026. At this time access to the Sandbox environment will be removed for use by Participants.

Appendix A – Supporting SIT Participants preparing for early Migration start

This section contains further supporting details on Qualification Working Group (QWG) options considered relating to early sandbox testing.

- *Note, the dates referenced in this section represent the original dates aligned to v1.0 of this document and are pre CR055 dates. They have not been updated to reflect CR055 as per the main document sections.*

When developing the Sandbox Testing guidance, some QWG members indicated that they would like Sandbox made available earlier, as concerns raised that the proposed 10 Feb '25 date is later than expected and limits the testing possible and value of Sandbox for PP, nothing that the environment would only available 2 months prior to Migration Start (M11/M12) – 4 Apr 2025.

This was noted as primarily an issue for Supplier and Agent SIT Participants preparing for early migration start. Options exist to bring forward the starting date for when the Sandbox environment can be made available to SIT Participants, BUT,

- o Each has challenges and may not offer the benefits that may be expected.
- o Bringing the dates forward creates additional risks – these need to be considered against potential mitigations and benefits gained.

The following 2 pictures provide the options presented to QWG Supporting SIT Participants preparing for early Migration start and the analysis provided to QWG for determining earliest available date for Sandbox on UIT Environment.

These lead the programme to conclude on maintaining the proposed 10-Feb-2025 start date for Sandbox using the UIT environment in line with option 1 but also supporting option 4 as a mitigating activity.

- o Decision made not to progress options 2 and 3 in favour of a combination of option 1 and 4
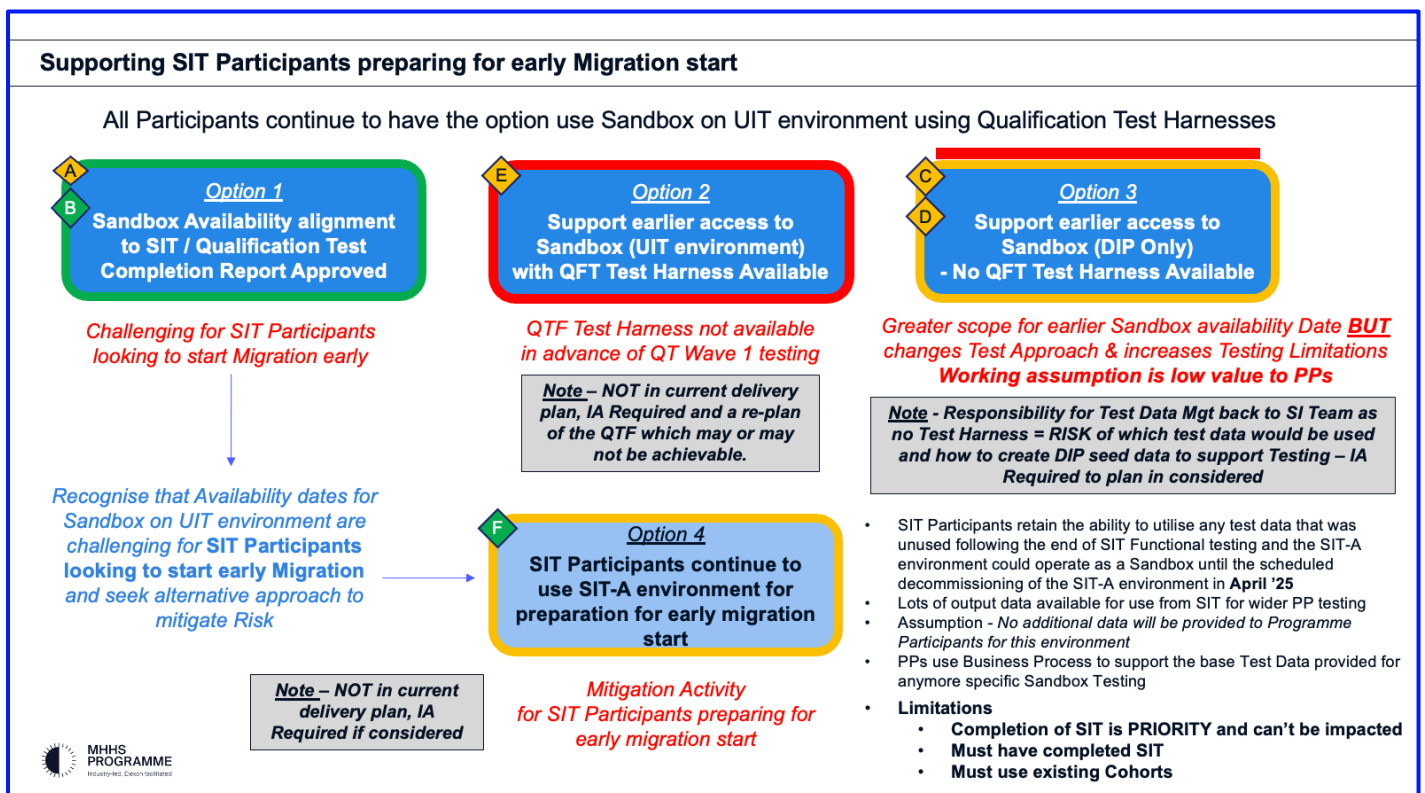

Figure 6 – Options presented to QWG Supporting SIT Participants preparing for early Migration start

*Figure 7 – Analysis presented to QWG for determining earliest available date for Sandbox on UIT Environment*

Appendix B – Original Sandbox Timelines, pre CR055 updates

Version 2.2 of this document, published May 2025 updated the expected implementation dates within this document reflect the updated Programme Plan post approval of MHHS Change Request CR055 - Amendments to M10 and corresponding milestones.

For traceability and additional context, the original timelines included in *section 5 - When will the E2E Sandbox, using the UIT environment, be Available?* and **Section 7 – Summary of Sandbox Testing available form dates** were updated but the originals have been moved into this section for easy reference, without having to refer back to the document version 1.0.

Old versions below.

The following picture shows where Sandbox Testing fits alongside the other test phases and the interlinks between them to enable the start of Sandbox Testing by PPs.
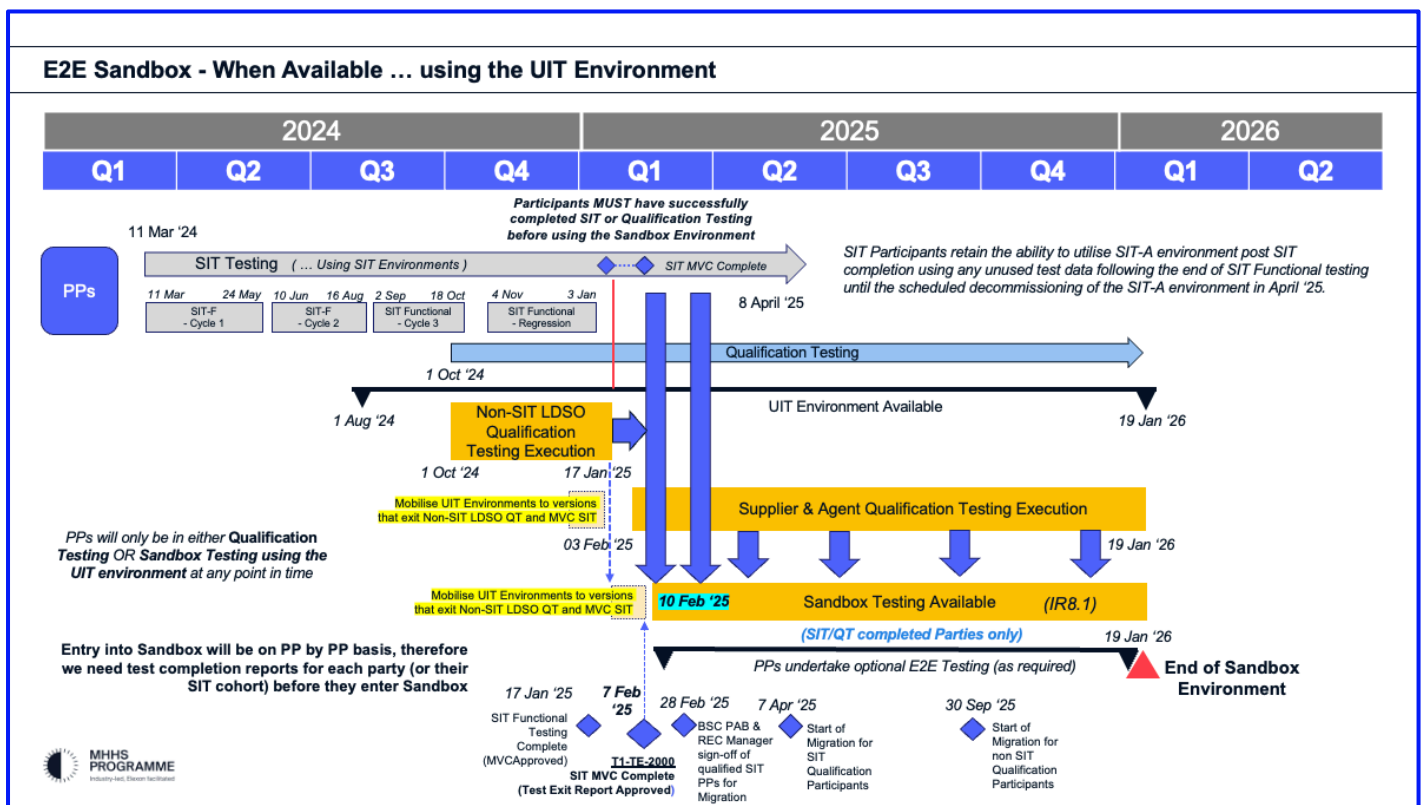
NOT CURRENT VIEW - Previous Version 1.0 Timeline - *Figure 2 – E2E Sandbox – When Available*

The following picture shows the preparation activities and dependencies that have been identified to get to the start of Sandbox Testing, using the UIT environment.
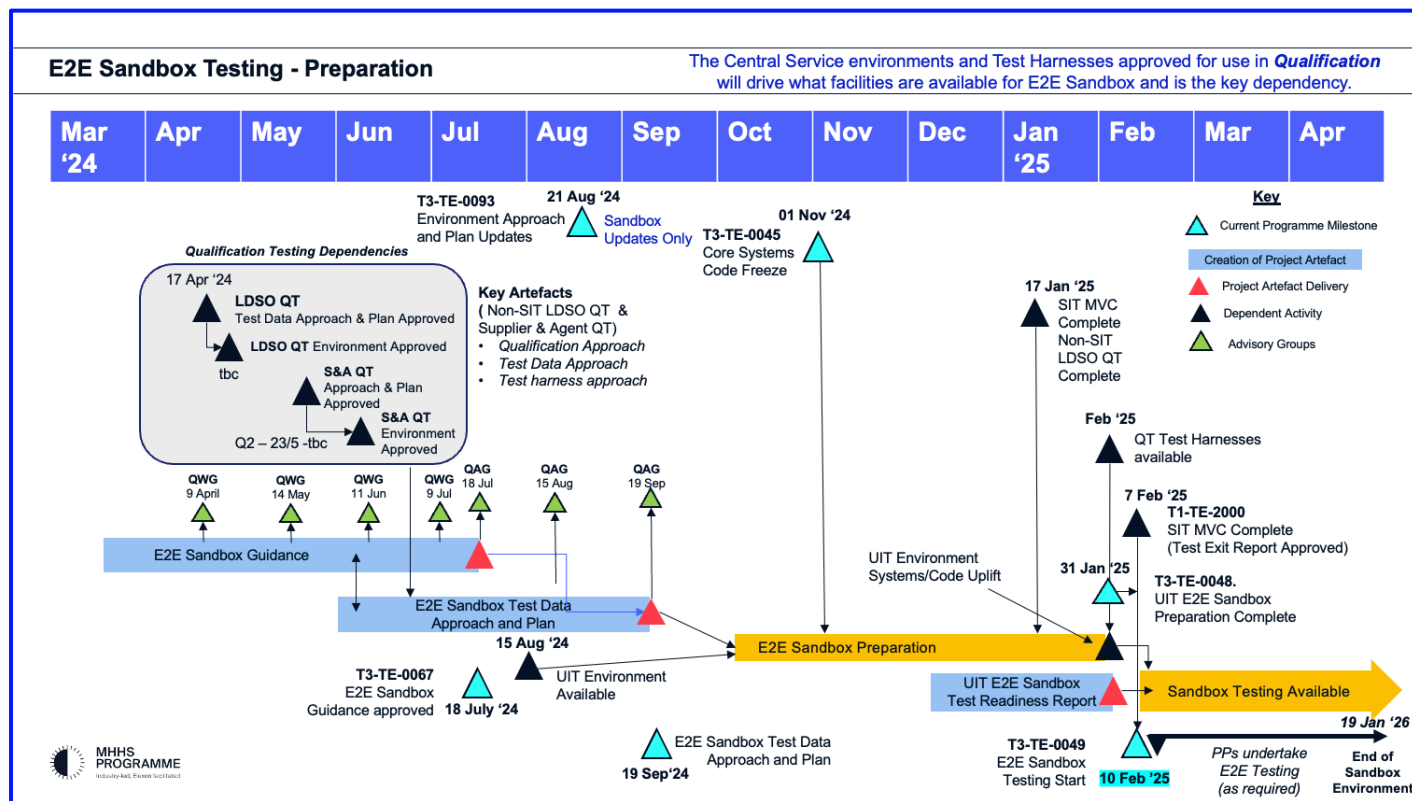
NOT CURRENT VIEW - Previous Version 1.0 Timeline *- Figure 3 – E2E Sandbox – Preparation*

Summary of Sandbox Testing available from dates

PP Type	E2E Sandbox Testing (*using UIT Environment*)	RISK MITIGATION ACTIVITY **Early Sandbox Testing** (*using SIT-A Environment*)
SIT LDSOs SIT Suppliers & Agents	From 10 Feb 2025	From 6 Jan 2025
Non-SIT LDSOs Non-SIT Suppliers & Agents	From 10 Feb 2025	Not available

NOT CURRENT VIEW - Previous Version 1.0 Dates