



Security Assessment

# My World - Meta Utopia

Mar 29th, 2022



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# Summary

This report has been prepared for My World - Meta Utopia to discover issues and vulnerabilities in the source code of the My World - Meta Utopia project as well as any contract dependencies that were not part of an officially recognized library. A comprehensive examination has been performed, utilizing Static Analysis and Manual Review techniques.

The auditing process pays special attention to the following considerations:

- Testing the smart contracts against both common and uncommon attack vectors.
- Assessing the codebase to ensure compliance with current best practices and industry standards.
- Ensuring contract logic meets the specifications and intentions of the client.
- Cross referencing contract structure and implementation against similar smart contracts produced by industry leaders.
- Thorough line-by-line manual review of the entire codebase by industry experts.

The security assessment resulted in findings that ranged from critical to informational. We recommend addressing these findings to ensure a high level of security standards and industry practices. We suggest recommendations that could better serve the project from the security perspective:

- Enhance general coding practices for better structures of source codes;
- Add enough unit tests to cover the possible use cases;
- Provide more comments per each function for readability, especially contracts that are verified in public;
- Provide more transparency on privileged activities once the protocol is live.

# Overview

## Project Summary

Project Name	My World - Meta Utopia
Platform	Ethereum
Language	Solidity
Codebase	
Commit	

## Audit Summary

Delivery Date	Mar 29, 2022 UTC
Audit Methodology	Static Analysis, Manual Review

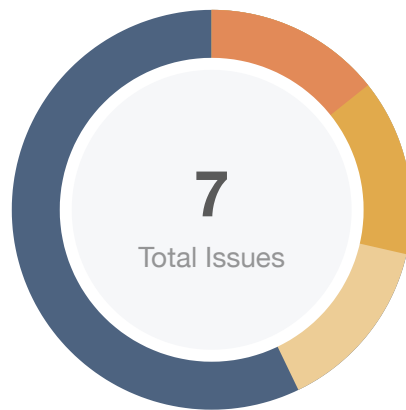
## Vulnerability Summary

Vulnerability Level	Total	Pending	Declined	Acknowledged	Mitigated	Partially Resolved	Resolved
● Critical	0	0	0	0	0	0	0
● Major	1	0	0	1	0	0	0
● Medium	1	0	0	1	0	0	0
● Minor	1	0	0	1	0	0	0
● Informational	4	0	0	4	0	0	0
● Discussion	0	0	0	0	0	0	0

## Audit Scope

ID	File	SHA256 Checksum
LCK	Land2.sol	5e0242aa027b4ea7bc58ceef0a790f4119e56ff303207ebb28c17c92be7dd5e4

# Findings



<span style="color: red;">■</span> Critical	0 (0.00%)
<span style="color: orange;">■</span> Major	1 (14.29%)
<span style="color: gold;">■</span> Medium	1 (14.29%)
<span style="color: yellow;">■</span> Minor	1 (14.29%)
<span style="color: blue;">■</span> Informational	4 (57.14%)
<span style="color: green;">■</span> Discussion	0 (0.00%)

ID	Title	Category	Severity	Status
LCK-01	Centralization Risk in Land2.sol	Centralization / Privilege	<span style="color: orange;">●</span> Major	ⓘ Acknowledged
LCK-02	Initial Token Distribution	Centralization / Privilege	<span style="color: gold;">●</span> Medium	ⓘ Acknowledged
LCK-03	Third Party Dependencies	Volatile Code	<span style="color: yellow;">●</span> Minor	ⓘ Acknowledged
LCK-04	Discussion on Token Transfer Flow	Control Flow	<span style="color: blue;">●</span> Informational	ⓘ Acknowledged
LCK-05	Variables That Could Be Declared as constant	Gas Optimization	<span style="color: blue;">●</span> Informational	ⓘ Acknowledged
LCK-06	Missing Emit Events	Coding Style	<span style="color: blue;">●</span> Informational	ⓘ Acknowledged
LCK-07	Variables That Could Be Declared as Immutable	Gas Optimization	<span style="color: blue;">●</span> Informational	ⓘ Acknowledged

## LCK-01 | Centralization Risk In Land2.sol

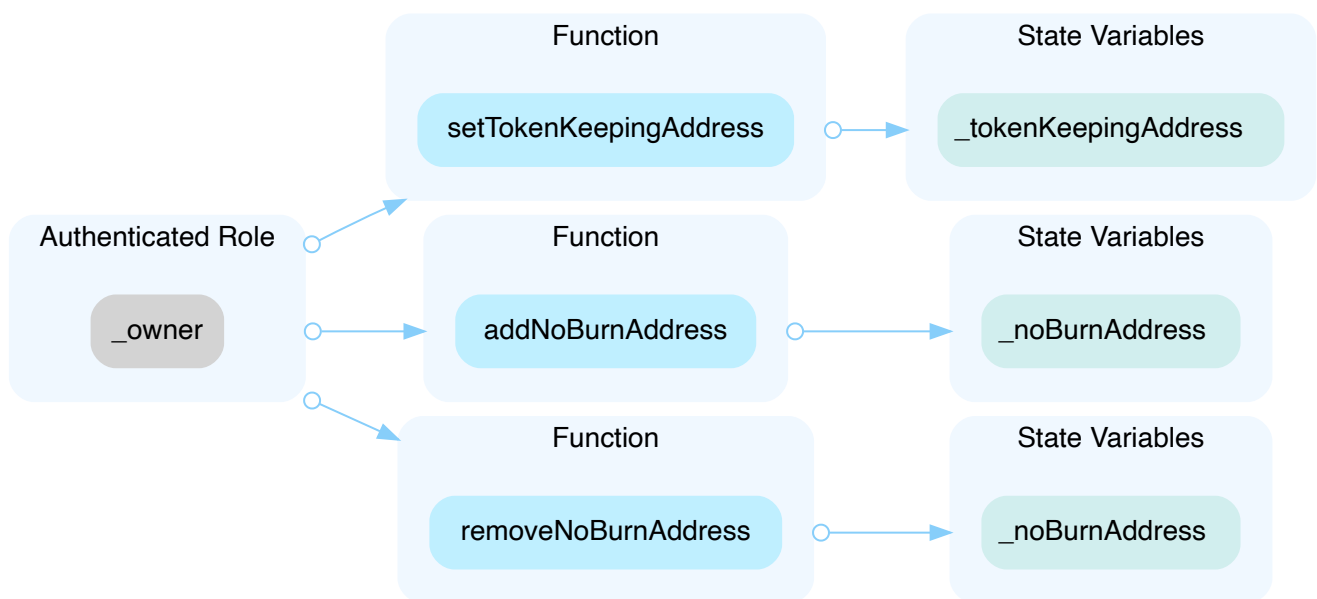
Category	Severity	Location	Status
Centralization / Privilege	● Major	Land2.sol: 53~58, 71~75, 80~84	📄 Acknowledged

### Description

In the contract `LAND2` the role `_owner` has authority over the functions shown in the diagram below.

Any compromise to the `_owner` account may allow hackers to take advantage of this authority, and the address added by the `addNoBurnAddress()` function can transfer or trade on the `LAND` token without restriction.

Any compromise on the `_owner` account could allow hackers to exploit this power, and addresses added by the `addNoBurnAddress()` function could be transferred or traded for `LAND` tokens without restriction.



### Recommendation

The risk describes the current project design and potentially makes iterations to improve in the security operation and level of decentralization, which in most cases cannot be resolved entirely at the present stage. We advise the client to carefully manage the privileged account's private key to avoid any potential risks of being hacked. In general, we strongly recommend centralized privileges or roles in the protocol be improved via a decentralized mechanism or smart-contract-based accounts with enhanced security practices, e.g., multisignature wallets.

Indicatively, here are some feasible suggestions that would also mitigate the potential risk at a different level in terms of short-term, long-term and permanent:

## Short Term:

Timelock and Multi sign ( $\frac{2}{3}$ ,  $\frac{3}{5}$ ) combination *mitigate* by delaying the sensitive operation and avoiding a single point of key management failure.

- Time-lock with reasonable latency, e.g., 48 hours, for awareness on privileged operations;  
AND
- Assignment of privileged roles to multi-signature wallets to prevent a single point of failure due to the private key compromised;  
AND
- A medium/blog link for sharing the timelock contract and multi-signers addresses information with the public audience.

## Long Term:

Timelock and DAO, the combination, *mitigate* by applying decentralization and transparency.

- Time-lock with reasonable latency, e.g., 48 hours, for awareness on privileged operations;  
AND
- Introduction of a DAO/governance/voting module to increase transparency and user involvement.  
AND
- A medium/blog link for sharing the timelock contract, multi-signers addresses, and DAO information with the public audience.

## Permanent:

Renouncing the ownership or removing the function can be considered *fully resolved*.

- Renounce the ownership and never claim back the privileged roles.  
OR
- Remove the risky functionality.

## Alleviation

The My World Meta Utopia team acknowledged this finding.



## LCK-02 | Initial Token Distribution

Category	Severity	Location	Status
Centralization / Privilege	● Medium	Land2.sol: 38	ⓘ Acknowledged

### Description

The 2.1 million `LAND` tokens are sent to the contract deployer when deploying the contract. This could be a centralization risk as the deployer can distribute `LAND` tokens without obtaining the consensus of the community.

### Recommendation

We recommend the team to be transparent regarding the initial token distribution process, and the team shall make enough efforts to restrict the access of the private key.

### Alleviation

The My World Meta Utopia team acknowledged this finding.

## LCK-03 | Third Party Dependencies

Category	Severity	Location	Status
Volatile Code	● Minor	Land2.sol: 41	ⓘ Acknowledged

### Description

The contract is serving as the underlying entity to interact with third-party `BUSD` and `PancakeSwap` protocols. The scope of the audit treats 3rd party entities as black boxes and assumes their functional correctness. However, in the real world, 3rd parties can be compromised and this may lead to lost or stolen assets. In addition, upgrades of 3rd parties can possibly create severe impacts, such as increasing fees of 3rd parties, migrating to new LP pools, etc.

### Recommendation

We understand that the business logic requires interaction with `BUSD`, `PancakeRouter02`, `PancakeFactory`, etc. We encourage the team to constantly monitor the statuses of 3rd parties to mitigate the side effects when unexpected activities are observed.

### Alleviation

The My World Meta Utopia team acknowledged this finding.

## LCK-04 | Discussion On Token Transfer Flow

Category	Severity	Location	Status
Control Flow	● Informational	Land2.sol: 219	ⓘ Acknowledged

### Description

Under the current implementation, when users transfer or sell all of their LAND tokens, a tiny amount of LAND tokens will be left in their account. We understand that this may be a rule of this protocol and this is not an issue. However, users should be aware of this before using it.

### Recommendation

We recommend the team to be transparent regarding the transfer and sell token rule.

### Alleviation

The My World Meta Utopia team acknowledged this finding.

## LCK-05 | Variables That Could Be Declared As Constant

Category	Severity	Location	Status
Gas Optimization	● Informational	Land2.sol: 14	ⓘ Acknowledged

### Description

The linked variables could be declared as `constant` since these state variables are never modified.

### Recommendation

We recommend to declare these variables as `constant`.

### Alleviation

The My World Meta Utopia team acknowledged this finding.

## LCK-06 | Missing Emit Events

Category	Severity	Location	Status
Coding Style	● Informational	Land2.sol: 53~58, 71~75, 80~84	ⓘ Acknowledged

### Description

There should always be events emitted in the sensitive functions that are controlled by centralization roles.

### Recommendation

It is recommended emitting events for the sensitive functions that are controlled by centralization roles.

### Alleviation

The My World Meta Utopia team acknowledged this finding.

## LCK-07 | Variables That Could Be Declared As Immutable

Category	Severity	Location	Status
Gas Optimization	● Informational	Land2.sol: 15, 16, 18, 19, 35	① Acknowledged

### Description

The linked variables assigned in the constructor can be declared as `immutable`. Immutable state variables can be assigned during contract creation but will remain constant throughout the lifetime of a deployed contract. A big advantage of immutable variables is that reading them is significantly cheaper than reading from regular state variables since they will not be stored in storage.

### Recommendation

We recommend declaring these variables as immutable. Please note that the `immutable` keyword only works in Solidity version `v0.6.5` and up.

### Alleviation

The My World Meta Utopia team acknowledged this finding.

# Appendix

## Finding Categories

### Centralization / Privilege

Centralization / Privilege findings refer to either feature logic or implementation of components that act against the nature of decentralization, such as explicit ownership or specialized access roles in combination with a mechanism to relocate funds.

### Gas Optimization

Gas Optimization findings do not affect the functionality of the code but generate different, more optimal EVM opcodes resulting in a reduction on the total gas cost of a transaction.

### Control Flow

Control Flow findings concern the access control imposed on functions, such as owner-only functions being invoke-able by anyone under certain circumstances.

### Volatile Code

Volatile Code findings refer to segments of code that behave unexpectedly on certain edge cases that may result in a vulnerability.

### Coding Style

Coding Style findings usually do not affect the generated byte-code but rather comment on how to make the codebase more legible and, as a result, easily maintainable.

## Checksum Calculation Method

The "Checksum" field in the "Audit Scope" section is calculated as the SHA-256 (Secure Hash Algorithm 2 with digest size of 256 bits) digest of the content of each file hosted in the listed source repository under the specified commit.

The result is hexadecimal encoded and is the same as the output of the Linux "sha256sum" command against the target file.

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